

Stacks 617, 608

Vol. VI

FEBRUARY, 1920

No. 2

GENERAL LIBRARY

MAR - 3

UNIV. OF MICHIGAN

The
International Journal
of
Orthodontia
and
Oral Surgery

*A Monthly Journal Devoted to the Advancement of the Sciences
of Orthodontia, Oral Surgery, and Dental and Oral Radiography*

Martin Dewey, D.D.S., M.D., Chicago
Editor-in-Chief



PUBLISHED BY
THE C. V. MOSBY COMPANY,
SAINT LOUIS

\$5.00 Per Annum

Single Copies, 50 Cents

LISTERINE

offers a definite, dependable service to the Dental Surgeon in his operative work. The care exercised in the manufacture of Listerine insures a uniformity in preparation which may be relied upon to produce like results under like conditions.

LISTERINE

has an agreeable, refreshing taste, and this, combined with its well-proven antiseptic properties, makes it a most acceptable solution for use as a spray or wash prior to and after operations on the teeth or gums.

LISTERINE

possesses a twofold antiseptic effect. After evaporation, a film, consisting of boric and benzoic acid, with baptisia tinctoria remains on the surface to which Listerine has been applied.

A small quantity of Listerine evaporated from a watch glass, or other suitable container, will disclose a residue of these beautiful crystals in abundance, as Listerine is a saturated solution of boric acid.

May we send a bottle of Listerine to your address, Doctor, for your observation and use?

LAMBERT PHARMACAL COMPANY
2101 LOCUST STREET
SAINT LOUIS, MO., U. S. A.

WILLIAMS

Mail us that
Scrap Gold Today

U.S.M.

**SCRAP GOLD
REFINING**

When you send scrap gold to the mint you lose the platinum. When you sell it on "guess valuation" you get less than it is worth. When we refine it you not only get full value for the gold, but we allow you for every fraction of a grain of platinum.

You may either take your returns in cash or have your scrap gold converted into plate or solder, in which case the refining charge covers the entire cost.

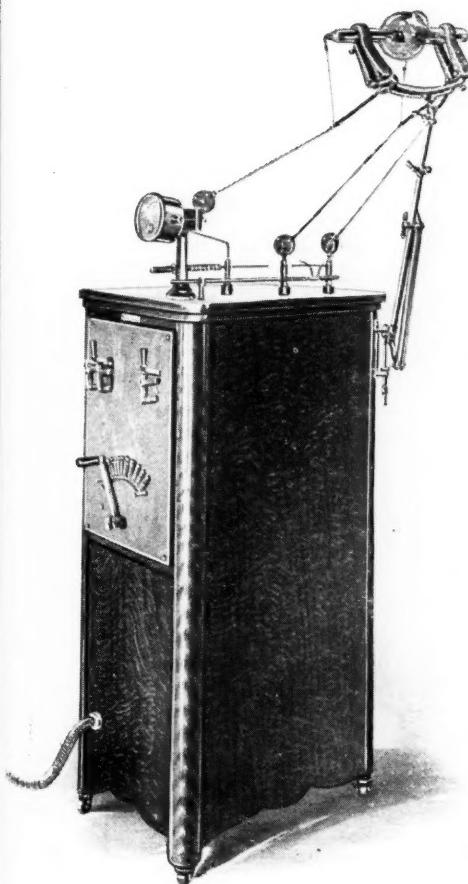
Tell your Dealer to send your scrap gold to us to be refined separately or send it direct. We allow you full value (less a small refining charge) for the pure gold recovered from your scrap gold and the market value of the platinum.

Try us on your next batch of scrap gold or waste of any kind containing precious metals

THE WILLIAMS GOLD
REFINING COMPANY
S M E L T E R S A N D R E F I N E R S
2978 MAIN ST, BUFFALO, N. Y.
B R I D G E B U R G, C A N A D A

Now Ready for Distribution

Universal Dental X-Ray Transformer



Operates on any cycle alternating current, 110-220 volts. Noiseless, Speedy, Perfect Regulation. Eight inch Spark Gap.

THE TUBE is the latest invention—a real discovery—self-regulating—has all the advantages of the Coolidge tube for this work—none of its drawbacks.

Our distributor will install and demonstrate without extra charge.

Send for Bulletin No. 111.

THE WM. MEYER COMPANY
818 W. Washington Blvd. Chicago

International Journal of Orthodontia and Oral Surgery

A Monthly Journal Devoted to the Science of Orthodontia, Including
Surgical Orthodontia, Oral Surgery, and Dental and Oral Radiography.

EDITORIAL STAFF—Orthodontia

MARTIN DEWEY, M.D., D.D.S., Chicago, *Editor-in-Chief*.
H. C. Pollock, D.D.S., St. Louis, *Associate Editor*.

Oral Surgery

M. N. Federspiel, D.D.S., M.D., Milwaukee.
Vilray P. Blair, M.D., F.A.C.S., St. Louis.
A. E. Smith, M.D., D.D.S., Chicago, Ill.
William Carr, M.D., D.D.S., New York.
R. Boyd Bogle, M.D., D.D.S., Nashville.
Jos. D. Eby, D.D.S., M.D., Walter Reed Hos-
pital, Washington, D. C.
Thos. P. Hinman, D.D.S., Atlanta.
Thomas B. Hartzell, D.M.D., Minneapolis.
Arthur Zentler, D.D.S., New York City.
Leroy M. S. Miner, D.M.D., M.D., Boston.

Dental and Oral Radiography

James D. McCoy, D.D.S., Los Angeles, Calif.
Robert H. Ivy, M.D., D.D.S., Walter Reed
Hospital, Washington, D. C.
B. Frank Gray, D.D.S., San Francisco, Calif.
C. O. Simpson, M.D., D.D.S., St. Louis, Mo.

All business communications should be addressed to the Publishers: C. V. Mosby Co., St. Louis.
(See page 126 for further information)

CONTENTS FOR FEBRUARY

Original Articles

A System of Keeping Orthodontic Records. By C. W. B. Wheeler, D.D.S., New York City	69
History of Orthodontia. By Bernhard Wolf Weinberger, D.D.S., New York City	74
The Conservation of an Exposed Pulp. By Carl O. Engstrom, D.D.S., Sacramento, Cal.	93
A Lock for the Lingual Arch. By S. E. Johnston, D.D.S., Kansas City, Mo.	94
Some Suggestions for the Formation of a "London Orthodontic Center," to Which Would be Allied a "London School of Orthodontics," for Post-graduate and Undergraduate Work. By Bertram B. Samuel, L.D.S., London, England	95

Department of Oral Surgery and Surgical Orthodontia

An Analysis of Gunshot Injuries to the Face. By V. H. Kazanjian, C.M.G., D.M.D., Boston, Mass.	97
--	----

Department of Dental and Oral Radiography

Notes on Interpretation of Radiograms. By B. Frank Gray, D.D.S., San Francisco, Cal.	111
--	-----

Abstract of Current Literature

Orthodontia, Oral Surgery, and Radiography	115
--	-----

Editorials

The Possibilities of the American Society of Orthodontists	126
Raise in Subscription Price	131

The International Journal of Orthodontia and Oral Surgery

(All rights strictly reserved)

VOL. VI

ST. LOUIS, FEBRUARY, 1920

No. 2

ORIGINAL ARTICLES

A SYSTEM OF KEEPING ORTHODONTIA RECORDS*

By C. W. B. WHEELER, D.D.S., NEW YORK CITY

FOR a number of years I have been extremely interested in the matter of orthodontic records, and the problem of getting these records with as little inconvenience and loss of time to the operator as possible.

This will necessarily be a short paper, as it deals with the description of a system of keeping records, which in itself, should be as compact and easily handled as possible to make it efficient, and for this reason, needs very little explanation.

Dr. Lischer's excellent paper which was read before this society at Pittsburgh in 1916, I believe was an inspiration to all of us, and he pointed out why records should be kept both for our benefit and that of others. He went over the reasons why every one should feel himself deeply obligated to keep such records, but this paper deals only with my methods, which may or may not be already used by some of you, in whole or part.

I trust it will bring out a discussion that will still further simplify the matter, because I believe, it is the thought of the immense amount of work involved that keeps many from having a most valuable record file.

1. DESCRIPTION OF CARDS AND ENVELOPES

I will first describe envelopes, records, and time index cards, then my methods of using them for notes, records, and as an appointment file.

Envelopes.—The envelopes that we use are four by six inches, so that any file this size will accommodate them, and an opening is cut in the upper left hand corner that allows the name of the patient and the case number on the card or cards enclosed, to show through. The space above the opening is left for the

*Read before the Nineteenth Annual Meeting of the American Society of Orthodontists, St. Louis, Mo., March 10, 11, 12, 1919.

case number, and as this number is the same as the one showing through the opening no mistake can be made (Fig. 1).

They are made of light weight inexpensive paper, and are used only for keeping the record cards, photographs, plans, radiograms, etc., together, and for making such notes or plans as are to be kept temporarily, and later transferred to Card A or B. When the front has been completely filled with notes, they may be thrown away and a new one substituted. The front is ruled in the regular way with columns for the appointment dates, as well as another to show the time consumed while the patient is in the chair.

Card A. (Fig. 2).—These are the regulation four by six inch cards with from one-eighth to one-quarter of an inch taken off the length before printing, so that they will fit easily into the envelope. On the front of the card is given a place for the name and the case number in the upper left hand corner, so it will show

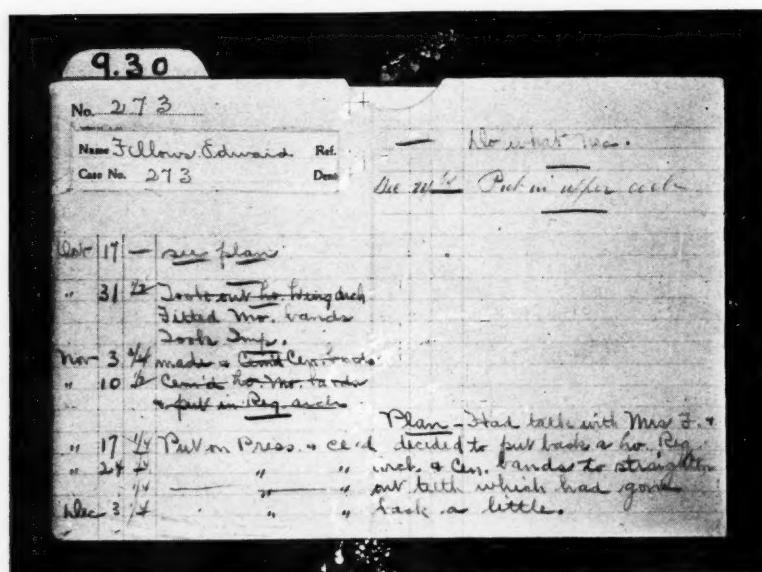


Fig. 1.

through the opening of the envelope. There are spaces arranged for references, estimated time of treatment, age, when the work was started, general health, before, during and after treatment: breathing before and after: phonation, before and after: and the etiology. A place for classification was not made on these cards, which was an error of the printer. It is readily written on each, and on the next lot will, of course, be taken care of. The back of this card is used for notes and is ruled for this purpose.

Card B. (Fig. 2).—On the front of this card are given places for the name and the case number, also for noting when the impressions are taken, appliances put in or taken out, and the particular kinds of appliances or retainers that are used. There are also columns to show what teeth are banded. On the back of this card columns have been ruled leaving spaces for appointments made during the treatment, time consumed at the chair, or lost by broken appointments.

Time Index Cards. (Fig. 3).—This is the regulation blank index card, four

by six inches, which, of course, is trimmed to fit the envelope, and on the tab which protrudes out, when the card is placed inside, is marked the different hours. If the first morning appointment is never before nine, we should start with this hour marked on the first tab, then on the next 9:15; next 9:30; 9:45; 10:00, etc., and so on throughout the hours of the day, until the time for closing. A number of these sets should be kept on hand. There should also be a number of index cards of a different color, with different intervals of time marked on them, such as: Fifteen minutes, thirty minutes, forty-five minutes, one hour, etc. The use of these cards will be explained under the description of the appointment file.

To use these cards and envelopes as I do, it is also necessary to have a small box or file conveniently placed on either the cabinet by the side of a chair, or

Fig. 2.

near there, that will hold about twenty of the envelopes. Also a regular file alphabetically arranged in another part of the office convenient for your secretary to get at.

METHODS OF KEEPING RECORDS

When a new patient starts work he is given a case number, and this with his name is placed on Cards A and B, the case number being also placed on the envelope.

Card A is filled out with such data as is obtainable at this time.

The envelope with cards enclosed is then placed in the regular file under the first letter of the patient's name.

Before I arrive at the office in the morning, or late in the afternoon of the

day before, the secretary takes the appointment book, and takes from the file the envelopes of such patients that are to be waited on that day or the next, as the case may be, at the same time slipping a time index card into the envelope, so that the tag protrudes, showing the hour of the patient's appointment.

Should there be an interval of time during the day not taken, an index card bearing figures denoting the extent of the period, such as one hour, one and a half hours, or whatever it may be, is picked out and placed between the envelopes of the patients where such a period occurs. This takes little if any more time than writing out a list of the patients for the day with intervals of leisure.

The bunch of cards are then taken and put into the small box or file at the side of the chair, and at a glance you can see just when the next appointment takes place, the extent of time allowed for it, when any interval free from appoint-

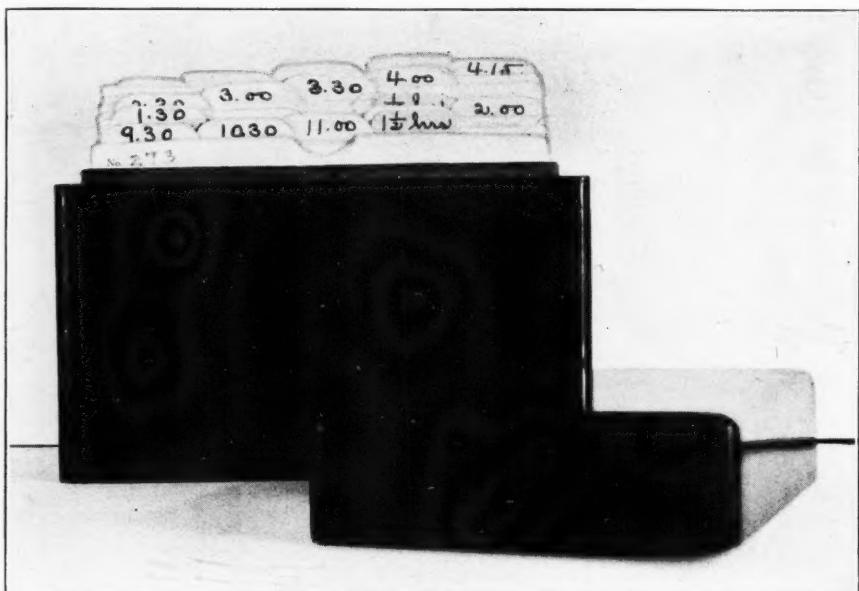


Fig. 3.

ments will occur during the day, and this without leaving the chair to go and look over the appointment book.

I will take up the matter again of a new patient. Should it be his first appointment for work, and the first patient of the day, his envelope will be found in front, and the tab or the index card will show the hours that he is due.

If at this sitting, impressions are taken, bands fitted, a plan laid out, or any other operation performed, an abbreviated note is made with pencil on the front of the envelope with the date. Just below it a note can be made of what you intend to do at the next sitting. This sometimes brings back quite quickly to the mind at the next visit just what was planned at the last; if this is not done, when a large number of patients are coming in, quite a little time may be lost during the day.

It takes but a moment to make these notes, and when the envelope is handed to the secretary, just before she makes the appointment, she knows something about what is to be done and can arrange the time accordingly. Then when she

has the leisure, work that has actually been accomplished is noted on Card A with the date. On Card B is placed the interval of time consumed. The record is then complete and is placed in the regular file.

The plan of having the entire history of the case at hand so that it is always before me, when patients are in the chair, is a great help in many ways, and if one acquires the habit of jotting down just what is done at the time that it takes place it soon ceases to be a burden. With the time consumed, the appliances and retainers used noted on the card, it is very easy to check up your mistakes and the inefficiency of appliances or retainers used in the correction of the different classes of malocclusion.

At the end of treatment, the time consumed at the chair, may be found in a few minutes, and this with the number of appliances used will give a definite idea of what our fee should have been in the treatment of such a case.

If an index is kept for any length of time, it will show the average time consumed in correcting the malocclusion occurring in the different classes and giving a solid foundation for estimating the amount of our future fees for such a condition.

To sum up: the main features that I have found a help to me in this system are:

- 1st. The compactness of data in each case.
- 2nd. Of having it before me every time the patient is in the chair.
- 3rd. Knowing at a glance at any hour of the day, just what work is before me.
- 4th. Being able to jot down when it is fresh in my mind, with no loss of time.
- 5th. To know what appliances have been used during treatment.
- 6th. And know the time consumed during the treatment of a case.

HISTORY OF ORTHODONTIA

(Continued from page 32)

BY BERNHARD WOLF WEINBERGER, D.D.S., NEW YORK CITY

CALVIN S. CASE, M.D., D.D.S., 1847.—The writings of many men who attained national and international prominence have been recorded in this historical resume, but few in the pursuit of their professional activities have written more on the subject of orthodontia than Case.

Before the *Columbia Dental Congress* in 1893, Case presented one of his first papers on *The Esthetic Correction of Facial Contour*. Like *Farrar's*, this



Fig. 1.—Dr. Calvin S. Case.

paper was practically forgotten until *Angle* in 1911 reintroduced the subject of *Root Movement*. Eighteen years elapsed before men in the practice of orthodontia began to pay a great deal of attention to this important phase of their work.

In this paper Case not only showed the possibility and advisability of changing the position of the malposed teeth in regulating, but also of applying force in such manner, when necessary, as to produce anatomic changes in the bony tissue adjoining the teeth, thus bringing the parts into harmonious and esthetic relations with the other features.

To do this he said, "It would be necessary to move the roots of the teeth as

(Copyright, 1920, by Bernhard Wolf Weinberger.)

well as the crowns so that any overfullness or deficiency in the root region would be changed to a condition of normality and harmony."

This root movement, either labially or lingually, he accomplished by devising a method of applying force well up opposite the roots of the teeth which served the same purpose as though the roots themselves were operated upon directly by the mechanism. This was accomplished by soldering short stiff bars to the bands upon the teeth to be moved and having these bars extend upwards outside of the gum to a point midway of the length of the roots. Force exerted in a lingual direction by means of an arch wire passing over these bars near their free ends and operating through a tube attached to the molar anchor bands would compel lingual movement of roots, whereas force applied in the opposite direction, by having the arch wire press against the under sides of the rigid bars, would force the roots in a labial direction. In either case the moving roots would carry with them the surrounding alveolar tissue producing the anatomic changes desired.

The paper was accompanied by models showing how such movements had been accomplished in actual cases in practice. A paper of similar purport had been read by him before the *Chicago Dental Society*, in February of the same year, describing a case operated along these lines during the previous year.

Beside the root movements in this first case the entire mandible needed retracting and this was accomplished, or at least aided, by the use of intermaxillary elastics operating between buttons attached to the upper and lower appliances.

It will be noticed that although both *Dr. Baker* and *Dr. Case* employed intermaxillary elastics at nearly the same time, there was this slight difference in the two procedures; Dr. Baker employed the elastics for the sole purpose of protruding the mandible and effecting a normal occlusion, while Dr. Case employed them to retract the mandible and as an auxiliary to an operation for the labial movement of the upper incisors, teeth and roots.

Although Dr. Case started to write for dental journals in 1881, his first paper pertaining to orthodontia was read before the *Michigan State Dental Society* in 1888, (*Ohio Dental Journal* in 1888) and was on the question of *The First Permanent Molar*. In 1890 in the *Dental Cosmos*, page 908, we find a paper entitled *The Angle System in Orthodontia*. In this he describes the important features of this system, as well as a "Jacket and Traction Screw." *Orthodontia—A Practical Case, Dental Review*, page 531, 1892, he states:

"The only apparatus that was used to overcome the prognathous position of the teeth and jaw was a simple band extending from the molars around the front teeth; the ends of the band were soldered to German silver wire bars (No. 19 E. s. g.), which were threaded and passed through long tubes, or pipes, attached to the buccal surfaces of the banded first molars. The first bicuspids were banded and carried short pipes in which the bars loosely rested, to aid in giving greater stability to the anchorage by preventing the molars from tipping forward.

"The centrals were also banded and possessed lugs for holding the traction band in position.

"Fig. 2 represents a model made from an impression taken during an intermediate stage of the operation with the traction apparatus in position. The interproximal spaces are closed and also the space nearly closed where a bicuspid had

been removed. The left second bicuspid was also removed about this time. The plate that was worn is laid upon the model.

"The nuts were never turned so as to give a painful tension to the traction band, and the apparatus was worn from the beginning to the end of the operation with comparative comfort and so little mental and physical derangement that school duties were never interrupted on this account.

"This I consider one of the most important factors in correcting every case of malposed teeth, compared to which time is a matter of every consequence. If there is anything distasteful to me it is to hear the much vaunted expressions relative to ease and shortness of time in which certain *skillful* operations were or can be performed; and especially a case in orthodontia, the treatment of which should always be kept subservient to the physiologic demands of nature, regardless of time."

Before reading his paper at the *Columbia Dental Congress* on "Root Move-

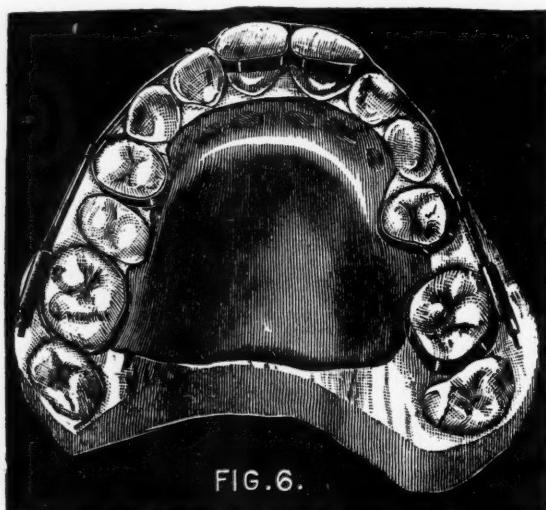


FIG. 6.

Fig. 2.

ment" Case published an article on *The Application and Influence of Force in Orthodontia, Dental Review*, August, 1892. It is in this treatise that Case first mentioned *Root Movement*. He says:

"To those, therefore, who hope to be eminently successful in this department I wish to emphasize the importance of thorough training in the foundation principles. Know well the possibilities presented by nature; the principle of force and its proper application and management; then if you will adopt some system in the main whereby the appliances may be constructed under your immediate supervision—permitting a freedom of ingenuity not possible in an attempt to use some particular set already in the market—a far more perfect treatment of malposed teeth will be given, suited to the needs of particular cases in hand.

"In the short time allotted to a paper I shall attempt to give only a few thoughts relative to the principles of force in the correction of irregularities of the teeth, dwelling more particularly upon the influence which different ways of attaching the appliance have in the production of certain movements—on the one

hand to obtain all the advantage which the force employed affords in producing the greatest amount of movement, and on the other, of so distributing or managing the anchorage force that little or no movement of other teeth is produced.

"In correcting the positions of malposed teeth, it should never be forgotten that the important and indispensable part of the operation is to so regulate the force that the normal functions and healthful conditions of the teeth and surrounding tissues are preserved, and that nature will permit their movement, physiologically, only so rapid as she is able to take care of the broken down tissue of retrogressive metamorphosis, caused by pressure of the tooth upon the walls of the alveolar socket. The rapidity of the movement will be influenced largely by the age of the patient, and differ as other things differ with people.

"The point which interests us under the caption of this paper relative to the application of force may be stated as follows: as soon as the applied force overreaches the possibilities of natural (and I may say physiologic) change—the surplus is liable to spend itself in producing some undesired and unlooked for condition. In other words, nature can only work so rapidly, and any attempt to force her beyond her natural powers will result—if not in disaster—certainly in a misdirection, and transferal of the force to other parts which should not, and would not, otherwise be disturbed. For instance, it is not always possible to move the apices of the roots of teeth in the same direction that we are able to move the crowns and it is usually quite important to avoid moving them in an opposite one.

"On account of the relatively hard surface layer of alveolar process, there is always a tendency for it to act as a fulcrum over which the tooth is tipped; but fortunately the apical region of bone in which the roots are embedded usually presents sufficient resistance for it to remain as the true and immovable fulcrum of the lever so long as force is not increased beyond the powers of absorption in other portions of the socket. The moment this does occur, however, the peripheral surface of the alveolus becomes the fulcrum while the load is delivered to the end of the root in the opposite direction, and in exact proportion to the surplus force. If we admit that the apical portion of the socket—blending as it often does with the cortical layers of true bone—presents greater resistance to changing the positions of that portion of the root, there can be but one conclusion; viz.: So long as the pressure is kept within physiologic bounds, it makes little difference in regard to the length of the arm of the lever, or, in other words, whether the force is applied near the occluding surface of the teeth or at the cervix, provided always that it is not restricted in its action by the method of attaching the appliances."

Some Principles Governing the Development of Facial Contours in the Practice of Orthodontia, Columbia Dental Congress, 1893, vol. ii, page 727. This was the first published presentation of bodily movement of the teeth, as well as the use of the intermaxillary force.

"The practice of correcting irregularities of the teeth has advanced so rapidly under the influence of modern methods of constructing regulating appliances, that it bears today little relation to dentistry proper, and in its most advanced practice may justly claim a distinct field in art and mechanics. Nor is the prophecy a wild one, that the science of orthodontia is destined to cover a still wider and more

peculiarly distinct field—that we are at the beginning of a renaissance in this department which will not rest or be satisfied with the mere correction of malposed teeth, but will include as an indispensable part of its repertoire the correction of all facial deformities which have resulted from irregularities of the teeth and jaws, and, in fact, the development of every esthetic contour of the face that can be accomplished by a scientific application of force to the underlying bony structure through the medium of the teeth.

"In the ordinary dental practice of correcting irregularities of the teeth, not enough attention has been given to facial effects; the principle aim having been to bring the teeth to a more perfect position and occlusion. While this has usually resulted in an improvement in the appearance of the face even when the features were in repose, the development of facial contours from an aesthetic standpoint seems rather to have been a result than one of the principal aims of the operator. I refer particularly to those cases that have been discharged as satisfactorily finished when the crowns of the teeth have been brought to a more perfect alignment, with little or no regard to the movement of the roots and the bony structure in which they were embedded. In many instances, too, had this latter movement been accomplished, as would not have been difficult with our present possibilities, there would have been a vast improvement in the general form and contour of the face; and this higher esthetic attainment would have been considered the most important part of the whole operation, producing a satisfaction and pleasure unequaled by few things in orthopedic surgery.

"*Dr. Farrar*, in the two volumes which were published of his valuable work on *Irregularities of the Teeth and Their Correction*, gives very little space to this branch of his subject; and then in reference only to the movement of the entire tooth in a lateral direction. On page 647 he says:

"The lateral movement of the entire tooth has always been regarded as difficult; and (in referring to successes claimed by the author) *Dr. Guilford* has even gone so far as to state in some remarks he made at a meeting in 1888, that he had always been "inclined to doubt" the accomplishment of the operation. Not only have I performed the operation several times, but I have advised its performance by others who have found it to be fully successful."

"It can be seen by these remarks that the movement of the roots of teeth is a rare and somewhat modern accomplishment, and doubtless an operation which never would have been possible under the old regime of regulating plates and their numerous force contrivances.

"He further very perfectly states the following axiom, the only method by which a movement of the roots in the direction of the force is possible: "The secret of effecting a lateral movement of the roots of the teeth lies in relatively fixing the antagonizing ends of the crowns while the force is being applied at their necks." In another place he restates the same proposition thus: "For the lateral movement of roots the power should be applied between the fulcrum and the point of resistance, or weight." Then he follows this by a beautiful illustration of this principle of force with a number of ingenious contrivances by which a lateral movement of the roots of the teeth has been effected.

"The purpose of this paper is to show how, with our present possibilities in the construction of regulating appliances, this principle of force may be also

applied to the movement of the roots of the teeth in any direction, and to illustrate also the importance of this possibility when it is observed in the operation where the teeth are moved in phalanx, that the bones of youth do not remain stationary to be plowed through by the roots in a process of retrogression metamorphosis, but that a considerable portion of the bone in which the teeth are embedded is carried with the roots in proportion as they are changed in position, thus enabling one to regulate many imperfections of the face by changing the shape and surface contour of the frame which supports and gives character to the features over all that portion which can be affected by a movement of the bones contiguous to the roots of the teeth.

"I shall be able to show by models to your perfect satisfaction, I think, that this movement of the roots and adjoining bony structure may be made to influence a far greater area in shaping the features of the face than would at first seem possible; and especially is this true over that part of the face contiguous to the roots of the anterior superior teeth, even to the changing of the shape of the nose.

"I am now able to correct, with perfect certainty of success, any marked depression or protrusion of the upper lip which is mainly due to a malposition of the roots of the incisor teeth. Instances are often observed among the youth who demand our professional services, which show a comparatively perfect alignment and occlusion of the teeth, and yet because of the position of the roots with a consequent abnormal depression or protrusion of the adjoining bone, considerable imperfection of features and external contour of the face is produced. These deformities are peculiar and not common, but have rarely engaged attention with a view of orthopedic treatment directed to the development of a more esthetic facial form. In the instance of a marked depression of the upper lip, as in Classes 1 and 2, they are often mistaken for a prognathous lower jaw, because of the lack of proper fullness in the central features of the face, which frequently affects the shape of the nose and deepens the lines on either side. For the same reason the cheek bones will appear at times abnormally prominent, giving to the face a broad and flattened appearance, especially if the cuspids being retarded in their eruption for the want of room take a more lateral and prominent position. If the lower teeth are in proper relative position and the deformity caused, as is most common, by the lower incisors occluding in front of the upper, every change desirable may be effected by an appliance attached to the superior teeth alone.

"On the other hand, if the entire superior dental arch is narrow and contracted with a high palatal dome, the teeth long, uncrowded and not materially affected in position by occlusion, the face will usually be long and narrow, the nose prominent, thin and of Roman type. In these cases the entire dental arch and alveolus should be expanded, and the force so applied and controlled as to retain the teeth in an upright position, especially in the process of carrying the anterior teeth forward, which is of vital importance in the restoration of the features of the face. The principal force, therefore, should be exerted upon the anterior superior teeth; and this force may be reciprocated by rubber bands extending from the posterior part of the upper appliance to the anterior part of an appliance that is attached firmly to all the lower teeth. These bands can be made to exert almost any desired force, according to the heft of the tubing from which

they are cut; and their positions being such as to not interfere with mastication, they can be worn continuously.

"If the inferior dental arch is large, with the teeth occluding outside of the alignment of the superiors, it may be reduced in size by the extraction of a bicuspid on either side and the anterior teeth forced back to fill the space.- If, however, the chin is abnormally prominent below the incisive fossæ, teeth should not be extracted from the lower jaw, the principal change to correct the facial deformity should be accomplished on the upper jaw, as in Case 5.

"I have abandoned all attempts to reduce a prognathous lower jaw by external pressure upon the chin, never having derived the same satisfaction from this operation that others claim. I find, however, that the rubber bands, before mentioned, extending from the upper and lower appliances can be made to exert all the force the patient can stand at the glenoid fossæ, and doubtless this influence tends to force the lower jaw to a more posterior position.

"On the other hand, with equal facility, I am able now to reduce a protrusion of the upper lip at that point where it merges into the nasal septum and orifices, when due to a malposition of the roots of incisor teeth alone, causing an abnormal prominence of the anterior nasal spine and incisive fossæ. This position of the roots of the superior incisors is not uncommon, even when the antagonizing ends are in perfect position; and often with the production of quite a marked facial deformity. As an illustration of this, I call your attention to the models of Case 6.

"In like manner, I am able to force the anterior *inferior* teeth bodily forward, with the entire alveolar ridge in which they are embedded. Instances are not rare where the point of the chin, the upper lip, and the anterior superior teeth are relatively in proper position, but with inferior teeth, from various causes, so posteriorly placed as to produce an abnormally deep depression or curve, in that portion of the lower lip along the line of the incisive fossæ. By forcing the anterior superior teeth forward, with the alveolus in which they are embedded, a more esthetic shape will be given to the chin; and this change, though slight according to measurement, will often produce an improvement in the general appearance of the face that is quite remarkable. The same is true, also, in a posterior movement of the inferior incisor teeth and alveolus, when they are so anteriorly placed in relation to the point of the chin as to obliterate the graceful curve of the lower lip.

"I believe that all who have made a study of this particular line of work will agree with me that a large proportion of all facial imperfections—which in many instances amount to actual deformities—are due to an inartistic relation of those features of the face whose form and contour are governed by the position of the teeth and the peripheral surface of the bone in which the roots are embedded. If, therefore, it is a fact that by force appliances attached to the crowns of the teeth of young persons the roots of the alveolus can be forced outward and inward to any desired extent, a new field will be opened to the practitioner in orthodontia, a principal feature of which will be the correction of many deformities of the face that have heretofore been considered beyond the reach of orthopedic surgery.

"In a large proportion of these deformities which seem to be due to protru-

sion or recession of the chin, it will be found upon a careful study of the face that the chin is not far from its proper relative position to the forehead, the upper portion of the nose, and malar prominences, and that the deformity in the main is due to the relatively imperfect position of the middle features of the face, governed by the anterior superior teeth and the adjoining bone in which they are embedded.

"If now, by ordinary methods, the crowns of these teeth are forced back-

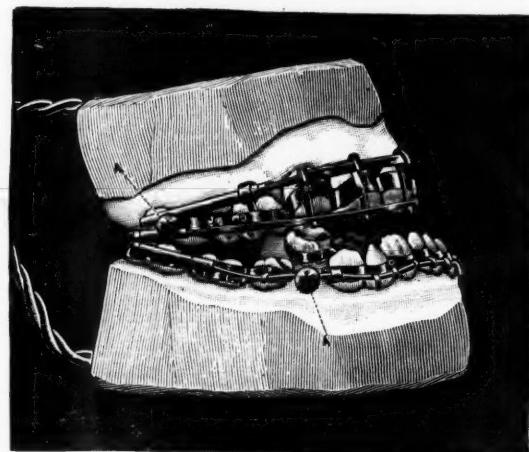


Fig. 3A.

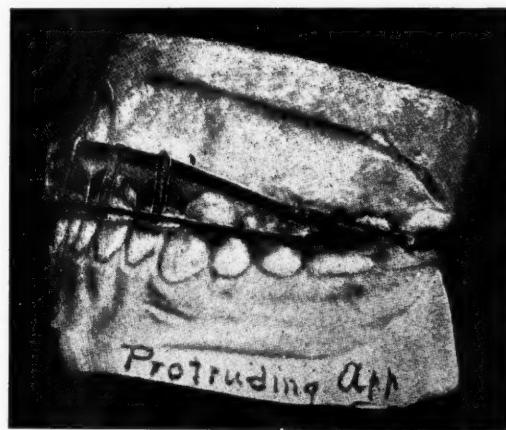


Fig. 3B.

Fig. 3B.—Modern contouring appliance adopted later by Case.

ward or forward to a more perfect alignment with the lowers, the facial defect is only partially remedied and the real deformity far from being removed, if not increased, as it may be, by the tendency of the roots to tip in an opposite direction. But if, on the other hand, the teeth are firmly and substantially grasped by appliances which are so constructed that the force can be applied directly to the roots while the antagonizing ends of the crowns are fixed or controlled in their movement—as *Dr. Farrar* has outlined for the lateral movement

of the entire tooth—it will be found upon trial that the roots as well as the immediately surrounding bone will be removed, and can be made to take a position which will give a far more pleasing appearance to the face.

"The peculiar apparatus which I use for applying force to the roots of the anterior teeth in facial contouring was first put into practical use December 24, 1892, and described in connection with a paper I read before the Chicago Dental Society the following February, which was published in the March, 1893, number of the *Dental Review*.

"Before describing the peculiar construction of the contouring apparatus I use in these cases, I wish to say that I endeavor to have all regulating appliances made as substantially and finished as perfectly as a piece of jewelry. The bands are fitted to the natural teeth with as much perfection—especially where they extend under the free margins of the gum—as a band for a crown. I use German silver principally, and heavily gold plate the apparatus before attachment.

"Too much praise can not be given *Dr. Angle* for introducing to our notice the value of German silver for this purpose, and also for many original ideas in the construction of regulating appliances.

"In constructing an apparatus for forcing the roots and adjoining bone of the anterior teeth forward, wide German silver banding material for the teeth should be selected, that is, five or six thousandths of an inch in thickness. This should be fitted to the crowns of the anterior teeth near the margins of the gum, perhaps extending beneath the margins on the proximal sides. Then bars of No. 18, E. S. G. wire, slightly flattened, should be soldered to each of the bands in an upright position, and bent so as to lie along the anterior surface of the crowns from the apex to where the bars join the band; here they should take a direction somewhat parallel to the gum; but free from the surface to about one-sixteenth of an inch above its margin, at which point they should be flattened or thinned so as to be more easily bent forward, and firmly clasped around a rigid bar which is made to extend from anchorage tubes attached to the posterior teeth. (See Fig. 3A.)

"This bar, which should be very rigid, is drawn without annealing from a No. 12 extra hard German silver wire to No. 18 (E. S. G.). The ends are threaded in the No. 4 hole of the *Martin* screw plate, and the central portion is slightly flattened in the rollers. Then it should be bent so as to rest when in proper position in the unclasped ends of the upright bars that have been left open to receive it. Before placing it in position, the nuts should be screwed on to work at the anterior ends of the tubes.

"This apparatus can be made to exert an exceedingly powerful force, but if put into practical use as it now stands, the ends of the roots and the adjoining bony structure would not be forced forward, notwithstanding the fact that the power is applied directly to the roots somewhat above the crevices. The crowns and the body of the roots, with a portion of the alveolus only, would be moved forward.

"To complete the apparatus, therefore, the fulcrum should be removed from the anterior alveolar plate and placed so that the power can be applied between it and the ends of the roots to be moved. In other words, the crowns should be

restricted or controlled in movement so that the applied force may be directed to the roots alone.

"I accomplished this by a second bar much smaller and thinner than the first, but proportionately rigid, which rests in depressions in the upright pieces along the occluding ends of the teeth. The ends of the fulcrum bar are threaded and passed through tubes that are soldered to the anchorage bands on each side below the power bar tubes, with nuts which work posteriorly to the tubes.

"An apparatus for reducing a prominence of the features by exerting a posterior force upon the roots of the alveolus of the anterior teeth, is constructed in a similar manner to the one just described, with the following exceptions: (1) The bands should be fitted to the crowns of the incisors near their occluding ends, for the purpose of obtaining a more rigid bearing in the changed application of force. (2) The lower ends also of the upright pieces should be made to clasp the fulcrum bar. (3) The nuts should be reversed in their relative positions to the tubes (which goes without saying). (4) The most difficult and equally important part of our task will now consist in moving the roots of the cuspids, if they are prominent, but their position is such if much force is applied with the present arrangement of the apparatus, the bars will slip through the clasps at the ends of the upright pieces. Therefore some provision should be made to prevent this, which may be accomplished by short sections of pipe clasped around and soft soldered to the bars.

"In considering the mechanical qualities of the contouring apparatus I have outlined, I wish to direct attention to the fact that the force expended at the anchorage attachments is largely neutralized by the reciprocating influence of the two forces, and this reciprocation is always equal to the power used on the fulcrum bar in preventing a movement on the occluding ends of the crowns. The balance of the power, which may be considerable in the general movement of the parts, must be sustained by the anchorage teeth, if not further neutralized by other auxiliaries.

"When the central features of the face are depressed with anterior superior teeth occluding posteriorly to the lowers, accompanied with the usual real or apparent prognathous lower jaw, great reciprocating force may be beneficially obtained from the rubber bands before mentioned. Rubber rings are cut from a three-eighths inch rubber regulating tube of good heft, and passed over the projecting ends of the anchorage tubes or buttons, on the upper appliance to buttons on a lower appliance opposite the first bicuspids. (See *A. A.*, Fig. 3A.) The latter appliance may be so constructed that the force will be distributed to all the inferior teeth, and indirectly to the jaw, forcing it to a more posterior position. Or it may be that the first bicuspids have been extracted, for the purpose of forcing the six anterior teeth back. In either case the elastic force of the rubber bands can be made to do effective work to the full extent of the power on both the upper and lower jaw, neutralizing force which otherwise would be expended upon a static anchorage.

"They are useful also as an auxiliary in the reduction of a prognathous upper jaw by reversing their attachments. In these cases I also make use of the occipital force, largely for the advantage I obtain in forcing the anterior teeth further into

their sockets. Cases of prognathous upper jaw with protruding teeth are rare in which there is not an abnormal prominence at the base of the nose. When force is applied to the crowns alone of the anterior teeth, this prominence may become more pronounced, even though the position and appearance of the teeth and the face are improved by the operation.

"In these cases, therefore, I consider it quite as important to move the roots as well as the crowns of the anterior teeth, when by so doing I find I am able to remove the entire deformity and greatly improve the general form of the face.

"I wish to say right here that time is a matter of little importance to me compared to the possibility of accomplishing the desired result without harm to the teeth or special local or systemic disturbance."

Abnormal Lateral Bite, Dental Review, 1895, page 538, Case states:

"One of the most difficult, and for a time, discouraging cases of irregularity of the teeth I have ever treated was that of a girl about fifteen years old, whose

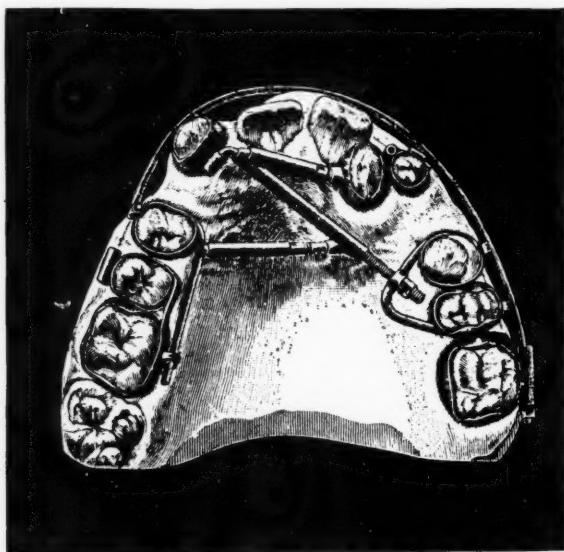


Fig. 4.

masticating occlusion carried the chin so far to one side of the median line when the jaws were closed that it produced a marked facial deformity which was far more noticeable because of the natural perfection and delicate chiseling of her features.

"In this and other cases of a similar character I have since treated, the extent of the abnormal closure was not caused wholly by jumping the cusps laterally, but was partly due to the general tipping of the teeth to more nearly approach perfect occlusion. That is, the upper teeth were all tipped in the direction that the lower jaw was carried, while the lower were tipped in the opposite direction to more or less fairly meet their occlusal surfaces. Nor was this peculiar attitude confined to the posterior teeth; the anterior teeth also partook of the same general posture.

"Now it will be seen at once that to correct such a deformity all the teeth must be tipped back to their sockets to assume their natural upright positions, and

their occlusion so adjusted that the abnormal posture of the lower jaw will not be necessary for mastication.

"The advantage of this principle has been practically demonstrated by the inclined plane since the dawn of regulating teeth, but beyond this infernal machine its various possibilities seem to have been lost sight of.

"The extending of rubber bands from the extreme buccal endings of an appliance attached to all the upper or the lower teeth to points upon the occluding set opposite the first bicuspids has become a common one in my practice in nearly all cases where there is an abnormal anteroposterior relation of the upper and lower anterior teeth.

"In Fig. 4 *a* is a traction screw bar which is attached to the right cuspid at one end and at the other to the left bicuspids. Upon this bar is a sliding tube *b*. Against a spur soldered to one end of this tube rests a jackscrew *c* which exerts its power against the left cuspid. At the other end of the tube *b* rests another jackscrew *d* which exerts its power against the right bicuspids.

"A moment's thought will convince one that with this apparatus the bicuspids

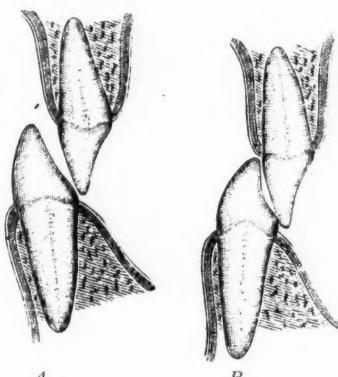


Fig. 5.—*A* represents original position of central; *B*, the present.

must be moved to the right, while the bicuspids are moved to the left. Its important possibility, moreover, as an object lesson, lies in the fact that the operator has complete control and direction of his power. For instance, if it should be found, as probably will occur, that the right cuspid takes its proper place before the left, it may be held back by the tube *b* being forced against it by the jackscrew *c*; the traction bar now extending all its power against the left cuspid. This force against the left cuspid can be augmented at any time by the jackscrew *d* exerting its power against the right bicuspids. Or the right bicuspids can be made to receive all the force exerted upon the left cuspid."

"The Esthetic Correction of Facial Contours in the Practice of Dental Orthopedia, Dental Cosmos, 1895, page 905.

"In answer to numerous inquiries, I have decided, in this connection, to describe and fully illustrate some of the important features of the latest methods I have adopted in the construction and application of the contouring apparatus.

"I do this with the hope that some of the difficulties I encountered in my first cases may be avoided by you, and which were partly due to the comparative

crude construction and application of the apparatus I used then and published in my early writings upon this subject.

"The limited area upon which force can be applied to a tooth, compared to that portion covered by the gum and embedded in a bony socket, has made it next to impossible, with all ordinary methods, to move the apex of the roots in the direction of the applied force; nor could this ever be accomplished with force exerted in the usual way at one point upon the crown, however near the margin of the gum it be applied, for the opposing margin of the alveolar socket must receive the magnitude of this direct force, and in proportion to its resistance it will become a fulcrum, exerting a tendency to move the apex of the root in the opposite direction.

"But if in the construction of the apparatus a static fulcrum is created, independent of the alveolus, at a point near the occluding portion of the crown, while the power is applied at a point as far upon the root as the mechanical and other opportunities of the case will permit, the apparatus becomes a lever of the third kind, the power being directed to a movement of the entire root in the direction of the applied force.

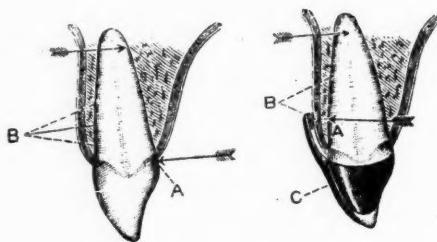


Fig. 6.

Fig. 7.

"This proposition is made plain by reference to the diagrams. In Fig. 6 let *A* be a point upon a central incisor, at which force is applied in the direction indicated by the arrow, then will the opposite wall, *B*, of the alveolar socket, near its margin, receive nearly all of the directed force, and in proportion to its resistance will there be a tendency to move the root on the opposite direction. This proposition will also hold good even if we apply the force at *A*, Fig. 7, or as far upon the root as may be permitted, by attaching a rigid upright bar, *C*, to the anterior surface of the crown; the only difference being that we distribute the direct force over a greater area. But if, as in Fig. 8, we attach to the lower end of *C* a traction-wire or bar, *F*, and further enforce the mechanical principles of our machine by uniting its posterior attachment to the anchorage of the power bar *P*, we will have neutralized our anchorage force materially and created an independent static fulcrum at *D*. Our apparatus now will distribute its force over the entire root, and give us complete direction and control of whatever power we put to it.

"The entire tooth can be carried forward bodily, or either end can be made to move the more rapidly. The force thus directed to the ends of the roots will have an increased tendency to move the more or less yielding cartilaginous bone in which they are embedded.

"The construction of the anchorage attachment which now remains to be

described is of the greatest importance to the ease and accuracy of its application and its subsequent usefulness.

"Two molars, or the first molar and a bicuspid, and sometimes all three, should be selected for the anchorage teeth. When these are accurately fitted with wide bands, an impression in compound, of one side at a time, including the cuspids, should be taken. The bands should then be removed from the teeth without bending, and carefully placed in their proper position in the impression, which should be filled with Teague's or other investing compounds. You now have the bands upon a small model that will hold them firmly in their proper relative positions during all the soldering process.

"As the position and mechanical perfection of the power tube (Pt, Fig. 8) is of paramount importance, it should receive first attention.

"Select a strong tube one-half to three-fourths of an inch in length, that

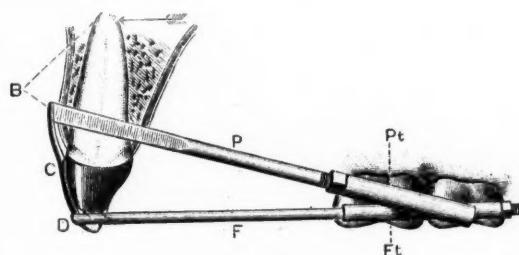


Fig. 8.



Fig. 9

loosely fits the threaded end of the bar. Its anterior end should be placed so that the nut will work freely upon the bar without impingement upon the band, tooth or gum, and it should take a direction that points exactly to that place upon the cuspid over which the power bar is to extend. In order to strictly observe this important direction, it usually becomes necessary to raise one or the other end of the tube from the bands by the intervention of lifts. It is often convenient to rest its posterior end upon the lever tube, its sharp projecting edges being rounded so as not to irritate the cheek.

"The lever tube (Ft, Fig. 8) should also loosely fit its bar or wire, and be soldered directly to the bands, which it firmly unites, and thus serves to give statical strength to the anchorage. Their direction is not as material as that of the power tubes, because of the smallness and flexibility of the lever wire. Their posterior ends should project sufficiently free from the other parts to admit of the working of the nut. And in those instances where reciprocating rubber bands are to extend to a lower appliance—the advantage of which has been explained else-

where—I allow these tubes to project for that purpose, finding them much more convenient than the buttons which I formerly used.

"The tubes now being fitted with their joints turned toward the bands, they are attached with an abundance of silver solder, the bands also being united along their approximal surfaces.

"With the anchorage appliance and power band in place, the bands for the anterior teeth may now be fitted and cemented, allowing the upper ends of the upright bars to rest in front of the power bar. Finally, the lever bar is laced, and the contouring apparatus is ready to commence the application of force at the next sitting.

"An apparatus for moving the anterior teeth in the posterior direction is in the main constructed quite similarly. (See Fig. 9). The power bar is now being used for traction force, the same rigidity is not as necessary as in the other apparatus. I find, therefore, that a No. 16 wire, not flattened in front, is of sufficient size.

"The other, or lever bar, the force of which acts in the opposite direction to prevent the occluding ends of the teeth from being drawn back, should be as large as No. 18. It should be flattened in the same manner described for the power bar. The upper ends of the upright bars are grooved on their anterior surfaces to form a rest for the power bar; while a shoulder is filed on the posterior surface of the lower ends, which forms a slot, when in place, for the flattened lever bar to rest.

"It being understood with this apparatus that the power bar nuts work at the posterior ends of the tubes, while those of the lever bar work at the anterior ends. Proper provisions for this arrangement should be made when constructing the anchorage appliances."

Principles of Force and Anchorage in the Movement of Teeth, in the *Transactions of the American Dental Association*, 1897, page 89, Case states the following:

"While the teeth differ in shape from each other and from the postlever I have described, and while their alveolar surroundings do not present a uniformity of resistance to their movement and therefore while we can not calculate force and motion with mathematical accuracy, still the fact that they are embedded one-half their length in a yielding substance and subject to the frequent application of force for the correction of irregularities, the only way by which we can approach an exact science in the application of power for their movement is to consider them as levers propelled by a machine doing work on the tissues in which they are embedded.

"When power is applied at one point to the crown of a tooth at right angles to its long axis, it becomes a lever with combined qualities of the first and second kinds; it is one more than the other in proportion to the relative difference in the resistance between cervical and apical portions. And while the relative proportion of movement at these points will be governed largely by the stability of their bony surroundings, it may be influenced considerably, as with the post-lever, by the position upon the crown at which power is applied. For instance, in the construction of an appliance for the retrusion or retraction of the incisors with a

traction wire extending from molar anchorages, if we wish the least movement possible of the roots in the opposite direction, the wire should rest upon the incisors as near to the gingival margins as the gums will permit. I usually solder to the bands upright bars which extend to the highest points of the exposed faces of the crowns. Grooves or rests are cut at the upper ends of these for the wire, enabling it to span the interproximate gingivæ. (See Figs. 10 and 11.) I frequently extend these bars above the gum-margins, as shown in Fig. 12, in order to apply power that is equivalent to direct force upon the roots at points above the margins of the alveoli, and I wish to say that I find these procedures of the greatest importance in arriving at results for which they are designed."

Dr. Case, then reviews the paper above reported as a further description of his method.

"When great immobility of a single anchorage tooth is required, use for banding material German silver or platinized gold, No. 30 gauge, and as wide as the tooth will permit. When these are encountered and fitted, solder the power



Fig. 10.

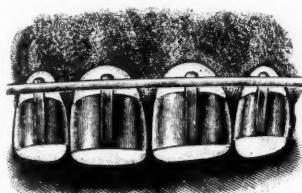


Fig. 11.

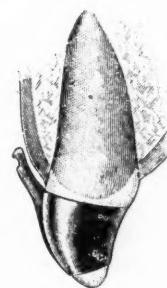


Fig. 12.

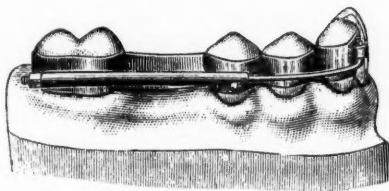


Fig. 13.

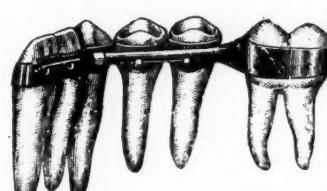


Fig. 14.

tube at the gingival margin. (See Fig. 13.) This should be sufficiently long to permit reinforcing it at either end with solder to the full width of the teeth, and large enough to carry a power rod that will be inflexible. Where it is possible, the power tube may rest above the gingival margin, soldered to an extension plate that is fitted or swaged to the surface of the crown and so shaped as to freely clear the gum.

"If the power tube is extended forward to the first bicuspid and its anterior end allowed to rest upon a narrow projection soldered to the bicuspid band, it will add greatly to the stability of the anchorage.

"It will be seen that any tendency of the molar to tip forward will carry the anterior end of the tube almost directly toward the root of the bicuspid, the movement being prevented by the rest. (See Fig. 14.) Nor will such a device offer

any special obstruction to the movement of the bicuspid, the rest sliding along the tube.

"It is often more convenient to sustain the anchorage with a flattened bar soldered to the lingual aspect of the molar band which extends to and engages with rests upon the bicuspids. This is especially applicable where it is desired to reduce an anterior protrusion with a small flexible traction wire encircling the teeth. Frequently the lower cuspids are anteriorly prominent, the incisors are crowded, irregular, and somewhat extruded, but not protruded,—in fact, they are frequently retruded, presenting one of those cases where the extraction of a bicuspid is indicated, were it not for the fact that the first molar on one or both sides is missing. Here the anchorage for forcing back the cuspids with a buccal bar may be sustained with a tube, instead of a flattened bar, which extends along the lingual aspect of the bicuspids, but not supported upon rests. An inflexible rod is fitted into these tubes (one on each side), and engages with hooks soldered to the incisor bands. (See Fig. 15.) If the incisors are retruded, the ends of the bar may be threaded for nuts at the anterior ends of the tubes to force the incisors forward, the two forces being reciprocal. It will be seen that any

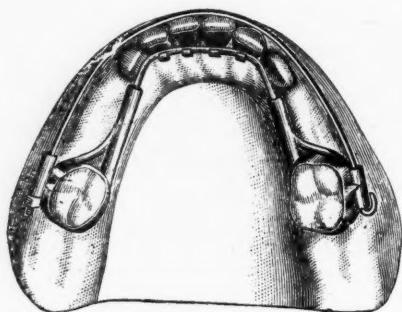


Fig. 15.

forward tipping of the molars will be prevented by the incisors sustaining the anchorage support, the force tending to intrude the incisors."

New Methods and Appliances in Orthodontia, Dental Review, 1898, page 573, Case states:

"The demands of a practice that is limited to dental orthopedics and the construction of artificial vela has led to the invention and practical application of so many ways and methods that are distinctively individual, that I am able to say today that everything in my practice covering every variety of movement of malposed teeth from the very beginning, where the material and implements to the final retaining appliances, is characterized by personal ways and means.

"I do not wish to be understood as implying by this that I have not been dependent upon the thought and skill of other men to whom I shall always feel grateful—for that foundation which has enabled me to build this system of practice. To Dr. Edward H. Angle I am principally indebted. In fact, it was by following his method, at first, of constructing regulating implements and finally seeing the almost unlimited opportunities presented by building a regulating apparatus upon bands cemented to the teeth, that led me to specialize my practice to this branch of dentistry.

"To Dr. Norman W. Kingsley I am indebted for the foundation to my system of constructing artificial vela.

"While this expander will probably always hold an important place in my practice, I have been using of late another form which is quite as effective in most cases and much easier to construct. (See Fig. 16.)

"A German silver wire should be selected for the lingual bow of sufficient size (B. and S. g. No. 14) to perform its work at the distal ends without bending. That portion which rests back of the incisors is filed flat to about one-third or one-fourth of its diameter in thickness.

"In the process of soldering the rests for the jackscrew as shown in Fig. 16, the temper is removed from the flattened portion so that it can be easily bent. It will be seen that the expansion of the anterior portions of the arch will be in proportion to the amount of curvature given to the flattened part. For instance, when the flattened part has come to a straight line by the outward pressure of the jack, or has been made straight in the first place, as shown by A, Fig. 16, no

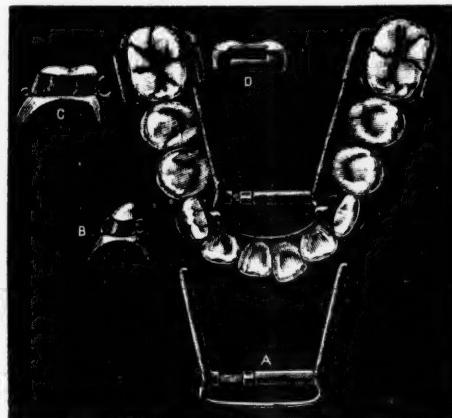


Fig. 16.

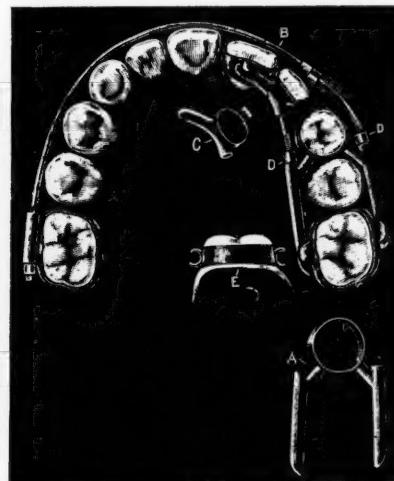


Fig. 17.

further expansion can occur between these points. The entire power will then be directed to the expansion of the distal portion of the arms.

"Class 2. One of the most common forms of irregularity is in those cases where the proper eruption of the cuspids has been retarded or prevented for the want of room. When this is due to the premature extraction of the deciduous cuspids the space will frequently be entirely closed by the adjoining permanent teeth. An apparatus that is admirably adapted for the correction of this form of irregularity is shown in Fig. 17.

"The object to be obtained is to force the bicuspids and incisors back to their proper relative positions sufficiently to give room for the cupid and at the same time produce a symmetrical arch."

In the *Dental Cosmos*, 1904, page 345, is an article *Origin, Use and Misuse of the Intermaxillary Force, and Its Relations to Occipital and Other Anchorage Forces*, giving correspondence, etc.; as well as dates as to the priority in the use of intermaxillary elastics, and force.

In 1908 Case brought out his book entitled *Dental Orthopedia*.

Dr. Case's contributions to orthodontia are numerous, so that it will be impossible to review them all at this time.

Case's classification is interesting in so far as to the complication of same. He has divided this into two sections, one on page 194, according to group, the other on page 260, according to classes. The combined classification embraces twenty-six divisions. The idea of the second grouping was to illustrate the type of appliance to be used in each class.

"In the author's opinion it is unscientific to place in one class malpositions which, though similar in occlusion, produce widely different facial deformities and consequently demand widely different methods of treatment.

"In this work therefore irregularities are divided into two general divisions. In the first division are placed conditions that are not susceptible of classification. These are named *Simple and Complex Irregularities*. They are divided into six groups. In the second, or classified, division, are placed distinct types whose correction is dependent upon the effect they produce or are destined to produce upon the physiognomy. These are named *Dentofacial Irregularities*. They are divided into seven classes."

TABLE OF GROUPS

- Group 1. Intrusion and Extrusion.
- Group 2. Malalignments.
- Group 3. Maltumed Teeth.
- Group 4. Contracted and Expanded Arches.
- Group 5. Abnormal Interproximate Spaces.
- Group 6. Impacted Teeth.

CLASSES OF DENTOFACIAL IRREGULARITIES

- Class I. Maleruption of Cuspids—Three Types.
- Class II. Protrusion of the Upper Teeth with Lower Normal—Five Types.
- Class III. Retruson of the Lower Teeth with Upper Normal, and Upper Protruded—Four Types.
- Class IV. Retruson of the Upper Teeth with Lower Normal, and Lower Protruded—Five Types.
- Class V. Bimaxillary Protrusion.
- Class VI. Bimaxillary Retruson.
- Class VII. Open Bite Malocclusion.

THE CONSERVATION OF AN EXPOSED PULP

BY CARL O. ENGSTROM, D.D.S., SACRAMENTO, CAL.

ALTHOUGH cases of this kind do not belong in the writer's practice this direct treatment of the pulp may be of interest to some.

The case presented was that of a girl ten years of age. The upper left permanent incisor was minus part of the crown. This was due to an accident. There was a distinct exposure of the pulp in the region of the gingival third of the crown and a very thin layer of dentine covering the pulp near the incisal third. The redness of the pulp was in this latter part quite visible. The case was taken to a dentist and in his examination he put the point of an explorer into the exposed pulp causing a slight hemorrhage. The case was again presented to me. The saliva had bathed the tooth for several hours before I made my first treatment.

A band was made and cemented on the tooth for the protection and retention of treatments to be applied. The band was so made and placed that a clear view of the pulpal wall could be had. The cavity was then irrigated with warm, distilled water. A pellet of cotton moistened with one-half per cent chlorazene was placed in the cavity, and over this was placed a pellet of cotton containing sandarac varnish. The next day this treatment was repeated, and also the following day, except that cement was used in sealing instead of cotton and sandarac varnish. This last treatment was left in place for two days, and another applied. After four days another treatment was made and others followed with intermissions doubling each time. The vitality of the pulp was tested with the chip blower at each treatment. The pulp was not otherwise interfered with, and when sound dentine had been deposited, so that the red of the pulp could not be seen, at the same time revealing by test the vitality of the pulp, a layer of zinc oxide powder was applied and covered with zinc oxide cement.

Treatment was started February 17, 1919, and six months afterward the tooth was in good condition.

In about the first two irrigations of the cavity normal salt solution would doubtless be better. It will be noted that in this treatment there was very little interference with the pulp in its own reconstructive process. The inflammatory process which follows a wound of this nature was not enhanced as would naturally be the result when the symptoms of inflammation are contradicted by the ordinary pulp treatment. Conditions were clearly in view where changes could be noted from time to time. This is not possible where blind treatment is resorted to, such as ordinary pulp capping.

There is no question in the writer's mind but that many pulps are destroyed unnecessarily, which practice only leads to increased trouble later. Many pulps display greater vitality than is generally accorded them, reference being made to exposed and hypertrophied pulps of long standing. Surely other means, more scientific than the ordinary capping of pulps, deserve the earnest attention and study of the dental profession.

A LOCK FOR THE LINGUAL ARCH

By S. E. JOHNSTON, D.D.S., KANSAS CITY, Mo.

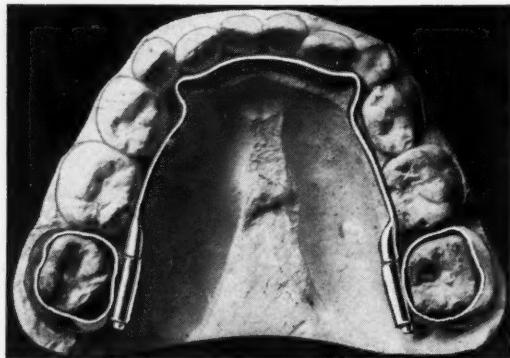
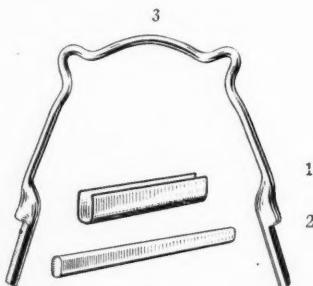
THIS clasp lock holds the arch securely in place and moves the anchor teeth bodily when expanding the arch.

The lock consists of two parts; Fig. 1, a clasp 8 mm. long, which grasps Fig. 2, a wire bar of the same length flattened on two sides, making it .040 by .056 inch.. This wire bar forms the distal end of the lingual arch.

The clasp is soldered to the lingual side of the molar band parallel with the gingival margin of the gum and just free from it.

TECHNIC OF MAKING THE LOCK

From clasp gold plate .010 inch thick, cut a piece 8 mm. by 6 mm., partially bend with round pliers, forming the clasp lengthwise of the piece (Fig. 1). In the vise and with pliers, using a piece of the wire bar as a mandrel, shape the



4

clasp to fit it perfectly. File the jaws of the clasp almost flush with the wire it is to hold, then with the wire in place, grasp just the edges of the clasp in the vise and screw up until it springs out; this will give the clasp a strong grasp of the wire bar.

The clasps may be soldered to the bands on the model, or free hand. I prefer to place the bands on the teeth, take the impression, replace the bands in the impression, and line them with wax before pouring the model, so they can be removed and replaced on the model.

The clasps are soldered to the bands and these replaced on the model. The lingual arch is shaped to conform to all the teeth and the distal end cut square, just long enough to touch the mesial end of the clasp (Fig. 4).

A piece of the wire bar is cut 12 mm. long (Fig. 2); this is placed in the clasp, letting the mesial end extend out enough to make a good attachment to the lingual wire proper. With hard sticky wax fasten these ends together, carefully lift bands and arch from the model, slip the clasp from the bars distally, invest and solder the lingual wire to the wire bars. (Fig. 3.)

In finishing do not round the end of the lingual wire which forms the shoulder against the mesial end of the clasp. This shoulder holds the whole arch from moving distally. Fig. 4 shows the completed appliance on the model.

An aid in making these clasps is a mandrel made from a steel bar the same thickness as the wire bars (.040 inch) and a little wider than the clasp is long, rounded at one end.

After the clasp has been partially formed with pliers, using a lead block for a counterdie, the clasp is swaged with this mandrel, after which it is finished in the vise as above described.

SOME SUGGESTIONS FOR THE FORMATION OF A "LONDON ORTHODONTIC CENTER," TO WHICH WOULD BE ALLIED A "LONDON SCHOOL OF ORTHODONTICS," FOR POST-GRADUATE AND UNDER-GRADUATE WORK*

BY BERTRAM B. SAMUEL, L.D.S., LONDON, ENGLAND

THE writer, in his association over a period of ten years with various London Children's Hospitals and L.C.C. Dental Treatment Centers, has had his attention directed to the following points:

(a) The difficulty of obtaining the necessary orthodontic treatment for children other than those of the comparatively wealthy classes.

The existent dental hospitals have more of this type of work than they are able to undertake. It is realized that a great amount of treatment is also done by private practitioners without charge or for fees inadequate to the services given, but the majority of dental deformities go uncorrected.

(b) The want of appreciation of the fundamental principles of orthodontic science shown by the average dental practitioner, and his consequent lack of interest in what should be one of the most absorbingly interesting branches of dentistry.

It is suggested that in this matter the Capital of the British Empire should not lag behind Continental and American cities, and that a school should exist at which all the leading London orthodontists would be associated, where undergraduate and postgraduate classes would be given, and shortly, where the

*Read before British Society for the Study of Orthodontics, October 8th, 1919. Reprinted from The Dental Record, London, January, 1920, xl, No. 1.

vast amount of clinical material at our command here in London could usefully be employed.

The writer feels certain that there would be no lack of senior students and practitioners willing to pay a fee for the privilege of attending courses at such an institution, and the plethora of cases where treatment is desirable and desired is manifest to any who have had the opportunity of seeing large numbers of children of the artisan and industrial classes.

Provided that such a scheme had leading professional support, following on the appointment of a small committee (by, say, this Society), the subjoined steps could be taken to give it being.

Consideration of various methods to obtain financial support, such as—

- (1) Appeal to the public through the press.
- (2) Private appeal to wealthy individuals.
- (3) Address to Ministry of Health.
- (4) Request to L.C.C. asking for capitation grant for L.C.C. scholars attending.

There are, of course, many other points that it is needless to elaborate at this stage, but granted that his premises are accepted by the profession, the writer is of opinion that none of the difficulties are insuperable, and that such an institution would be of immense service to the profession and directly and indirectly to the public.

DEPARTMENT OF ORAL SURGERY AND SURGICAL ORTHODONTIA

Under Editorial Supervision of

M. N. Federspiel, D.D.S., M.D., F.A.C.S., Milwaukee.—Vilray P. Blair, M.D., F.A.C.S., St. Louis, Mo.—Arthur E. Smith, M.D., D.D.S., Chicago.—William Carr, A.M., M.D., D.D.S., New York.—R. Boyd Bogle, M.D., D.D.S., Nashville.—Major Joseph D. Eby, D.D.S., Atlanta.—Thos. P. Hinman, D.D.S., Atlanta.—Arthur Zentler, D.D.S., New York.—Leroy M. S. Miner, M.D., D.M.D., Boston.

AN ANALYSIS OF GUNSHOT INJURIES TO THE FACE

By V. H. KAZANJIAN, C.M.G., D.M.D., BOSTON, MASS.

Demonstrator of Prosthetic Dentistry, Harvard University Dental School

THE great majority of gunshot wounds, except superficial cuts and abrasions, are inevitably associated with the facial bones, because of the thinness of the facial musculature and of the large amount of osseous substructure. Though the damage be but slight, a communication may have been effected with the nasal or the oral cavity, the antra, sinuses, or pharynx. The amount of injury as a result of gunshot wound, which the soft or hard tissues suffer beyond the entrance wound, is in the first instance the result of the speed, shape, and striking angle of the piece of metal, and in the second instance the result of the bony fragments which act as secondary projectiles, with almost explosive violence. These forces may cause a large path and an extensive wound of exit in the tissues; yet the actual destruction or complete tearing away of substance is usually not present to any marked degree, and the severed borders of the wound may be traced. The exaggerated size of the wound is due to the contraction of the severed muscles toward their origins and insertions, to the local inflammation, and to the weight of the shattered pieces of bone. A large number of facial wounds are seen with a small entrance and a small exit. The severity of such wounds depends almost entirely upon the anatomic location and the path of the piece of metal. Through-and-through wounds of the anterior part of the face may cause extensive destruction of the teeth and comminution of the bone, but in the main do not lead to alarming complications provided adequate treatment at an early period is effected. Contrary to this, however, wounds involving the posterior part of the face, especially those of the pharyngeal, carotid, and lower molar regions, are particularly dangerous. Such injuries may cause bilateral fracture of the mandible, and in many cases may be situated near enough to important blood vessels to insure a probable chance of severe hemorrhage.

The tongue, since it occupies almost the entire oral cavity when the mouth is closed, is liable to serious injury along with either the upper or the lower jaw. If the wound be limited to its apex or dorsum, its abundant blood supply promotes rapid healing in spite of severe laceration or even sloughing; but, if it be penetrated about its base, serious hemorrhage may ensue through involvement of the lingual arteries. Fragments of bone and teeth are apt to bring complicating factors, if driven into the tongue: they convey infections and elude detection or localization by radiogram (Fig. 1).

WOUNDS OF THE LOWER PART OF THE FACE

A wound of the lower lip represents a fairly common type of wound in connection with which there exists a small wound of entrance, at first obscure, at different points posteriorly, on the neck, cheek or face, leading to symphysis (Fig. 2). The lip may appear lacerated with appreciable loss of tissue, or may be

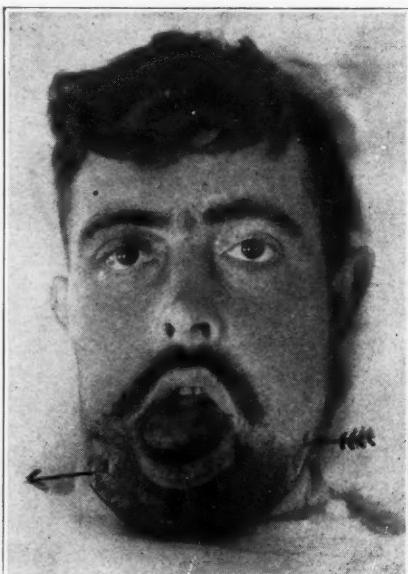


Fig. 1.



Fig. 2.

partially or entirely destroyed with attending comminution and destruction of the mandible at the symphysis. Other fractures of the jaw may occur as the result of transmitted force.

There are seen hideous, gaping wounds of the lower lip, chin, and even the sublingual region, which communicate with the oral cavity and which are accompanied by severe injury to the bone: but in many instances these are but extensive tears in the soft tissue, do not involve a loss of substance, and consequently lend themselves favorably to suturing at the proper stage in the treatment of the case (Fig. 3).

There also occurs a type of wound less commonly which is serious and extensive, involving laceration and destruction of the lower lip, chin, sublingual region, and even the upper aspect of the neck. These have a characteristic appearance and require special consideration since in addition to the mutilation of the soft tissues there usually occurs serious loss of the mandible (Fig. 4).

WOUNDS OF THE UPPER PART OF THE FACE

Injury of the upper lip is quite commonly seen and varies in extent from laceration and slight loss of tissue to a complete destruction involving the lower part of the nose.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

The more serious wounds of the upper part of the face may include a part or the whole of the nose, the eyes, the ears, and the zygomatic region. The maxilla is apt to suffer great comminution and considerable loss of bone in case

of injury of this type. The loss of the upper lip is invariably associated with mutilation of the anterior part of the maxilla, at times as far posteriorly as the



Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10.

molar regions, and in some rarer instances practically the entire maxilla, and the septum of the nose may be carried away. The involvement of one or both antra is common, and might almost be said to be a certainty (Figs. 5, 6, 7 and 8).

A lacerating wound of the cheek, if at all severe, communicates with the oral cavity and in many instances is sufficiently extensive to involve the angle of the mouth, the lips, the eye, the ear, and the lateral aspect of the neck. Usually there is free exposure of the bony substructure, mandible, maxilla, and zygomatic process (Fig. 9).

Wounds high on the cheek, if anything more than an abrasion, are practically certain to involve the ascending ramus of the mandible, the temporomaxillary articulation, and the parotid gland, and furthermore obviously give rise to paralysis of the side of the face which is injured. In the extreme instances the injury includes the mastoid region and the base of the skull (Fig. 10).

EFFECT OF FACIAL WOUNDS

The high degree of vascularity of the face gives opportunity for free primary hemorrhage following gunshot wound. The wounds become inflamed and speedily septic because of the presence of organisms in the nasal and oral passages.

In the event of gunshot wound of the face and jaw the patient undergoes considerable pain and physical and mental reaction; and furthermore suffers great inconvenience through the impairment of the most natural of functions; chewing, swallowing, breathing, speaking and the retaining of saliva. In spite of the peculiar disadvantages which accompany the wound, however, favorable progress toward recovery is made (1) because of the rich blood supply to the parts affected (2) because of the free flow of saliva which, though teeming with organisms, nevertheless maintains a slow and persistent mechanical irrigation of the wound and prevents the tissues from becoming dried and encrusted with blood, pus, and food particles, and (3) because of the opportunity for drainage to the nasal or oral cavity independently, if necessary, of the usual external drainage.

FIXATION OF THE BONY PARTS

In order to discuss clearly the question of splints and appliances used in the treatment of wounds of the face and jaw, an analysis of the nature of the bony injury is necessary, as compared to the maxillary fractures seen in civilian life. This latter type, usually the result of a fall, a blow, an accident, kick, and so on, and usually referred to in discussion as "accidental" without definite regard to their cause, is serious at times and may be compound, but is free from actual bony destruction except in the instances when teeth and their surrounding alveolar process are knocked loose. The lines of fracture are irregular, but well defined, and the displacement is less pronounced than in the case of war injuries. The healing process is as a rule more rapid and uneventful, though at times it is difficult to reduce the displacement properly, because of the fact that the irregular ends at the site of fracture, being but slightly comminuted, have a tendency to interlock. The patient suffers considerable pain and inconvenience, and mild complications such as localized inflammation and abscess; but beyond these the more serious complications do not usually occur except in the event of inadequate or delayed treatment.

But when the fracture of the jaw is the result caused by a bullet or other weapon of warfare, comminution and a definite, though perhaps slight, destruction

of bony tissues exists. Such injury may be confined to the teeth and alveolar ridges and not seriously or materially impair the continuity of the bone, while in other instances a large portion or the whole of the upper or the body of the lower jaw is blown away. In extreme cases it is often found that the injury has included the whole of the nose, the tongue, the sublingual region, or the entire lower part of the face.

The site of fracture following gunshot wound is not characterized, as is true in accidental cases, by an irregular line, but by multiple lines of fracture which radiate in many directions. The mobility of the parts is freer, and there is little or no tendency on the part of the segments to interlock rigidly. The pronounced mobility and displacement of the segments of bone is increased by the extensive laceration of the overlying soft tissues.

In the majority of cases the likelihood of grave complications confronts the attending surgeon. And in addition to the suffering caused by wounds of the face and jaw, as described, and the anxiety of the possibility of serious complications, it is the rule rather than the exception that the fortune of modern war made the patient the recipient of wounds of other parts of the body, wounds which need a separate scheme of treatment and which give rise to different symptoms and discomforts.

COMPARISON OF IMMEDIATE AND GRADUAL IMMOBILIZATION

During the period of the war many advances were made toward the perfection of the appliances used in the treatment of maxillary fractures, and many extremely ingenious devices were offered to the profession. To the casual observer there might appear to exist a complexity and confusion of appliances; but most of them in one way or another have served a purpose. All fall into two distinct classes, according to the intended object in their adaptation: (1) appliances and splints designed for the immediate fixation of the fragments, and (2) appliances and splints constructed to cause gradual reduction of bony displacement and deformity.

As previously described, the wound in the first days following injury is inflamed and septic, and the bony tissue after fracture is in extreme displacement, and mobile and poorly supported. At this stage it is important to note that a rigidity of the tissues brought on by contraction and scar formation has not yet occurred. As the sepsis and inflammation subside, so healing begins and sequestra are exfoliated, and the bone either consolidates to some extent or becomes firmer in a deformed position in the soft tissues.

Immediately, or soon after the time of fracture, the segments respond easily to manipulation, and the reduction of displacement is possible with the fragments maintained in correct position and alignment by comparatively simple splints; but if the immobilization of the bony parts is left until that later period when the fragments resist reduction because of the fact that healing has begun, then it is obvious that splints and appliances of a more complicated construction are needed.

It has been proved beyond doubt that the former method—namely, that of immediate or early fixation of the bony parts—is preferable, even though the

days just after injury are critical for the patient. So far the advantage of early fixation has been emphasized only from the mechanical viewpoint; but it is of equal importance to note that the immobilization of the bone and the reduction of the fracture have lessened the size of the wound and consequently diminished the irritation and inflammation of the soft tissues, and that there has been utilized that brief period of time in the progress of a case which precedes the onset of serious complications, should any occur which would prohibit work incident to the adaptation of splints. The patient is also rendered more comfortable, and is happier because he feels that something has been done to set him on the road to recovery.



Fig. 11.

In order to carry out a successful technic for the immediate fixation of the bony tissues, the following requirements are essential:

1. The procedure adopted must be sufficiently simple to make possible the treatment of a large number of cases. The dental mechanics attached to the department must have the facilities to make a large number of appliances easily, rapidly, and accurately, and also must have in a partial state of completion such appliances as headgears, metal bands for the teeth, etc. Promptness in the construction of splints is an essential factor in a scheme for immediate fixation.

2. The actual adjustment of the completed appliance must be sufficiently simplified to cause the minimum amount of pain to the patient. In view of the general condition of the wounded man, it is often advisable or necessary that minor operations, impression-taking, and other details incident to the construction of appliances be done at the bedside. For any step in the preparation and adjustment of the splint there is never justification for the use of a general anesthetic.

Private B was wounded on June 10, 1917, and admitted to the hospital on June 12, 1917.

There was a large lacerating wound of the lower part of the face extending from the right corner of the mouth to the submental region (Fig. 3). The mandible was severely comminuted, from the mental to the first molar region, with marked downward and inward displacement of fragments (Fig. 11), es-

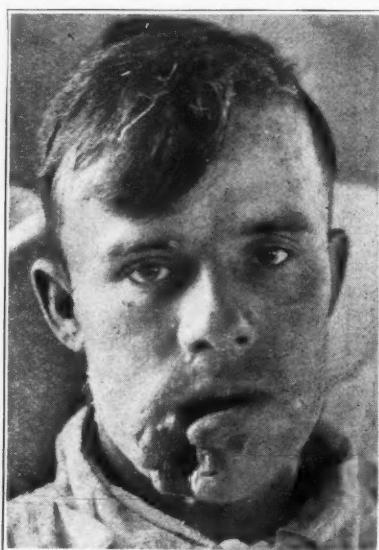


Fig. 12.

pecially at the site of the external wound. There was great laceration and inflammation of the oral mucous membrane. In addition, the patient was suffering from a wound on the right shoulder and on the left leg.

The general condition of the patient was fair. He was coughing quite freely and the temperature fluctuated up to 100° for a few days. Otherwise he was quite comfortable.

On June 17, the mouth was cleaned surgically by removing some sloughed and necrotic tissue, useless and loose teeth, and pieces of bone. There remained in the mouth two sound molars on each side of the jaw. Over those molars a band and arch splint was secured, giving anatomic relations of the remaining parts of the mandible. A vulcanite removable appliance was fitted to the arch of the splint, to give proper labial fullness and to prevent adhesion to the alveolar process during the process of healing.

On June 27, the wound was fairly clean, the edema and inflammation having disappeared (Fig. 12). The soft tissues were sutured.

The operation was performed under novocaine anesthesia.

1. The borders of the wound were excised.
2. The borders of the mucous membrane were approximated and sutured with catgut.
3. The borders of the skin could not be brought together on account of greater laceration of the external surface of the wound, and therefore a skin flap was turned from the right side of the face to cover the gap. (See Fig. 13.) A small drainage tube was inserted at the base of the wound.

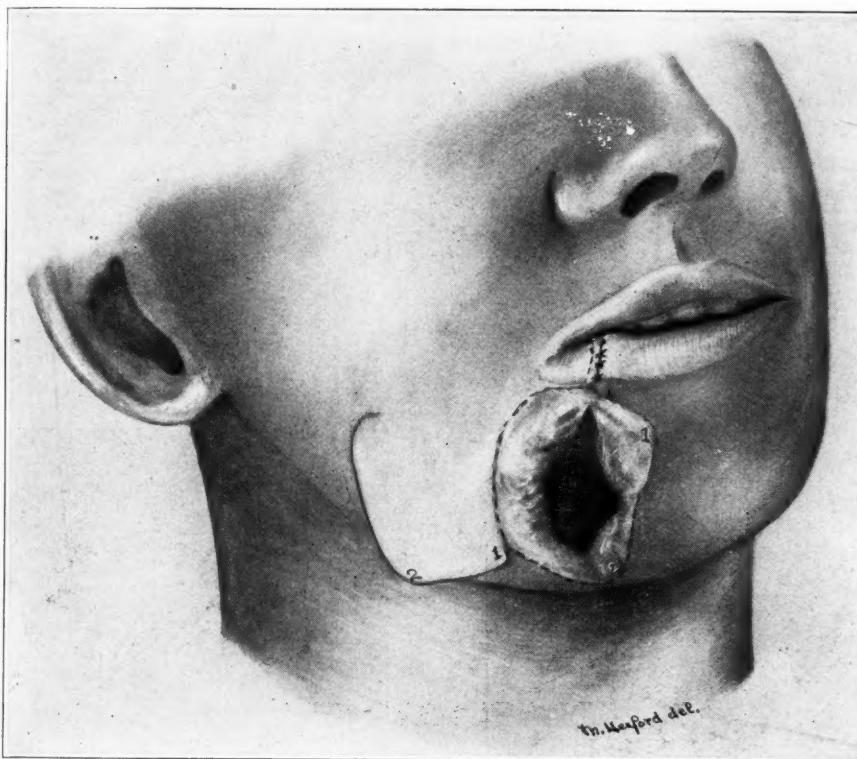


Fig. 13.

On October 17 and 19 it was necessary to open abscesses in the sublingual region, which were attributable to small sequestra of bone still to be exfoliated or removed by operation.

An x-ray picture showed that the lower right first molar was sufficiently involved in the region of fracture to hinder progress. This tooth was removed and a new splint of the same type as the former was cemented to place.

On November 1 the scar left by the drainage tube at the lower border of the wound was removed.

On November 19 the patient was transferred to England. All suppuration had ceased, the scars were very slight, and bony union was progressing in a satisfactory manner (Fig. 14).

2. The actual adjustment of the completed appliance must be sufficiently simplified to cause the minimum amount of pain to the patient. In view of the general condition of the wounded man, it is often advisable or necessary that minor operations, impression-taking, and other details incident to the construction of appliances be done at the bedside. For any step in the preparation and adjustment of the splint there is never justification for the use of a general anesthetic.

Private B was wounded on June 10, 1917, and admitted to the hospital on June 12, 1917.

There was a large lacerating wound of the lower part of the face extending from the right corner of the mouth to the submental region (Fig. 3). The mandible was severely comminuted, from the mental to the first molar region, with marked downward and inward displacement of fragments (Fig. 11), es-

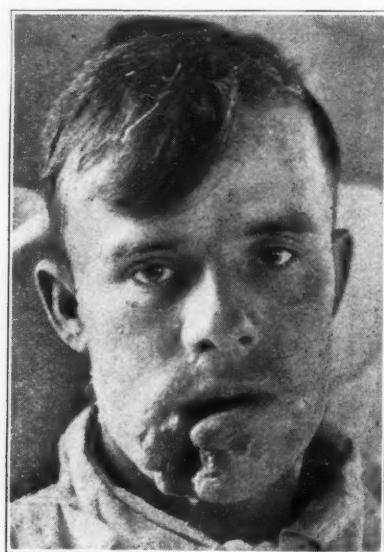


Fig. 12.

pecially at the site of the external wound. There was great laceration and inflammation of the oral mucous membrane. In addition, the patient was suffering from a wound on the right shoulder and on the left leg.

The general condition of the patient was fair. He was coughing quite freely and the temperature fluctuated up to 100° for a few days. Otherwise he was quite comfortable.

On June 17, the mouth was cleaned surgically by removing some sloughed and necrotic tissue, useless and loose teeth, and pieces of bone. There remained in the mouth two sound molars on each side of the jaw. Over those molars a band and arch splint was secured, giving anatomic relations of the remaining parts of the mandible. A vulcanite removable appliance was fitted to the arch of the splint, to give proper labial fullness and to prevent adhesion to the alveolar process during the process of healing.

On June 27, the wound was fairly clean, the edema and inflammation having disappeared (Fig. 12). The soft tissues were sutured.

The operation was performed under novocaine anesthesia.

1. The borders of the wound were excised.
2. The borders of the mucous membrane were approximated and sutured with catgut.
3. The borders of the skin could not be brought together on account of greater laceration of the external surface of the wound, and therefore a skin flap was turned from the right side of the face to cover the gap. (See Fig. 13.) A small drainage tube was inserted at the base of the wound.

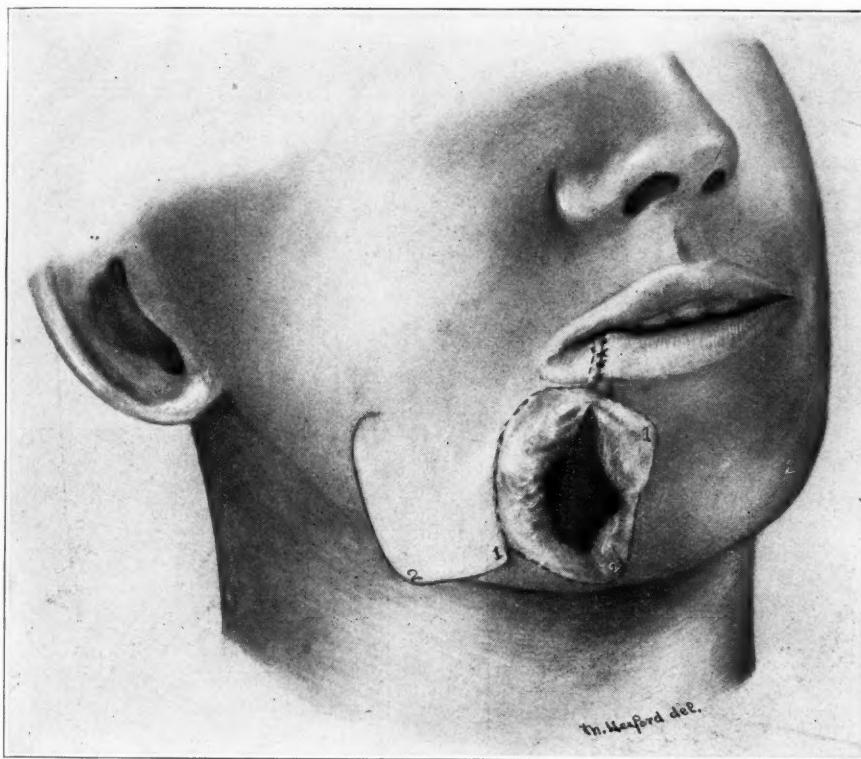


Fig. 13.

On October 17 and 19 it was necessary to open abscesses in the sublingual region, which were attributable to small sequestra of bone still to be exfoliated or removed by operation.

An x-ray picture showed that the lower right first molar was sufficiently involved in the region of fracture to hinder progress. This tooth was removed and a new splint of the same type as the former was cemented to place.

On November 1 the scar left by the drainage tube at the lower border of the wound was removed.

On November 19 the patient was transferred to England. All suppuration had ceased, the scars were very slight, and bony union was progressing in a satisfactory manner (Fig. 14).

Skipper Private S was wounded on July 31, 1917, and admitted to hospital on August 2, 1917. There was a large lacerating wound extending from the left angle of the mouth to the angle of the mandible. The left side of the

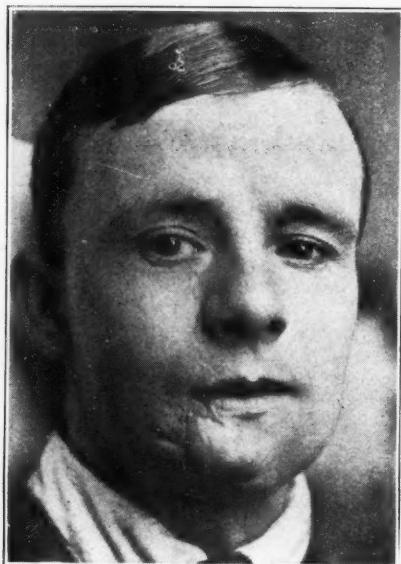


Fig. 14.



Fig. 15.



Fig. 16.

tongue was injured and inflamed, and attended with partial paralysis due to involvement of the hypoglossal nerve (Fig. 9).

The mandible from the left cuspid to the ascending ramus was comminuted,

with free exposure of the resulting fragments of bone and downward displacement. All the teeth of the right side of the upper jaw were destroyed. On August 8 a cap splint was cemented to the teeth of the lower right side, with an arch wire extending over the injured area of the left side. To the latter four fragments were suspended by fine wire sutures. An upper cap splint was cemented to the remaining sound teeth of the maxilla, and the lower jaw was thus immobilized by intermaxillary ligation between the two splints. On August 13



Fig. 17.



Fig. 18.



Fig. 19.

the wound of the face was partially sutured (Fig. 15), leaving the part near the corner of the mouth to granulate because of a distinct loss of tissue at that point.

Fig. 16 shows the condition of the patient on September 3, when a second operation was performed. The scar on the face was removed, and the missing portion at the left angle of the mouth was supplied with a small rectangular flap taken from the left side of the upper lip. The red border of the lower lip was freed and stretched to cover the raw surface of this flap (Fig. 17, 18 and 19).

On October 29 a small operation was necessary, to make further improvements in the left corner of the mouth. One of the larger fragments of the jaw which was suspended to the splint was exfoliated, and from time to time other small sequestra came away; but at the time of dismissal of the patient, Janu-

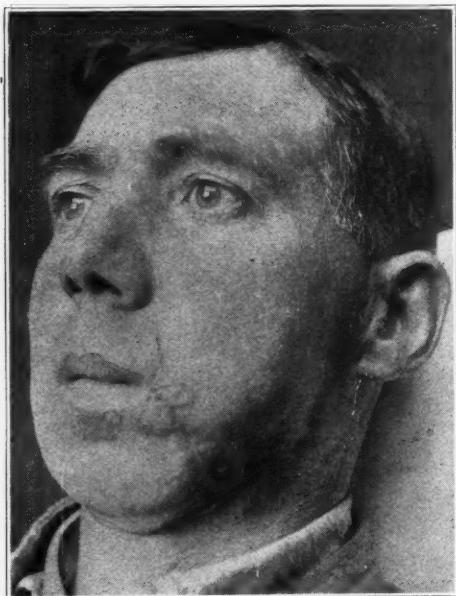


Fig. 20.



Fig. 21.



Fig. 22.

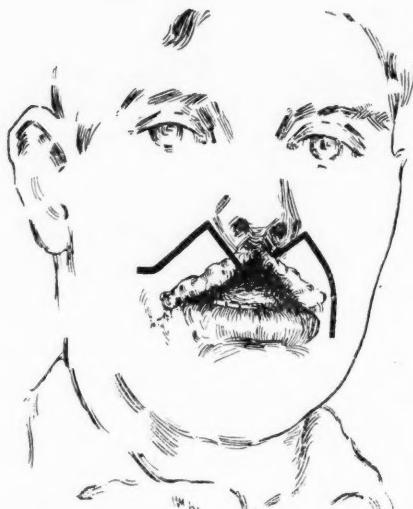


Fig. 23.

ary 10, 1918, there was a healthy bony growth of the mandible except for a space of about one-half inch at the angle, where fibrous tissue existed. The remaining teeth on the right side were in good occlusion with the upper teeth, and the facial scars were rapidly disappearing. The final condition before dismissal is shown in Fig. 20.

Private M received wounds of the face and shoulder on September 15, 1916, and was admitted to hospital on September 18. The upper lip was almost completely destroyed, and the right cheek and right portion of the lower lip were lacerated (Fig. 5).

The maxilla was comminuted with loss of tissue anterior to the molar regions, with accompanying destruction of the floor of the right antrum. The lower jaw was intact.

In accordance with the general treatment of the case, minor operations were necessary to remove sloughing tissue and to remove useless and loose teeth and particles of bone. A few stitches were inserted to support the mucous membrane, and a rubber tube was used to drain the region of the right antrum.

A few days after the patient was admitted to the hospital, a vulcanite splint attached by clasps to the molar teeth was used to mould the maxillary tissue

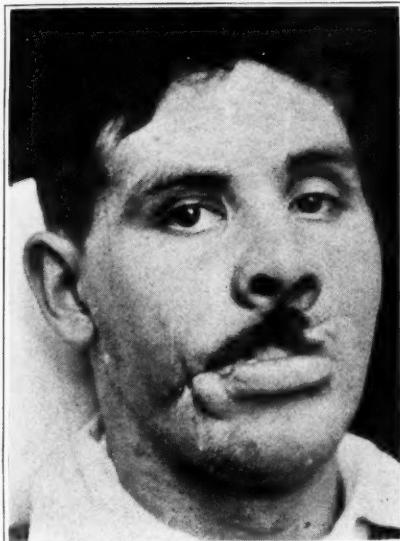


Fig. 24.

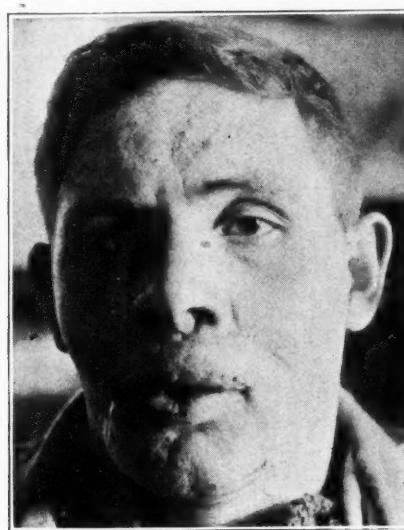


Fig. 25.

and to preserve the contour of the remaining buccal and labial tissues. This vulcanite plate, or splint, is essential to the repairing of the tissues, and is worn very early in the treatment even if it comes in contact with raw surfaces.

On October 17 the inflammation of the face had subsided sufficiently to allow suturing of the buccal portion of the wound with local anesthesia. The rules adopted for suturing are as follows: If the soft tissues are lacerated, but suffer no destruction, then the borders are approximated and sutured as soon as inflammation has been reduced. But, if there is a loss of soft tissue, only radiating portions of a wound respond to early suturing, while closure of the wound as a whole is postponed until suppuration, inflammation and contraction have ceased. In addition, the general condition of the patient must be satisfactory at the time of operation.

In this case recorded the radiating portions of the wound were sutured early in the treatment, and on January 9, 1917, under local anesthesia, rectangular flaps

were taken from the upper part of the face (see Figs. 21, 22 and 23) to form the upper lips, and thus finally close the wound. On February 2 the border of the upper lip was trimmed to make it shorter, and the margin of the mucous membrane was improved. At the same time the lower lip was shortened, to procure harmony with the upper lip, by removing a small triangular piece at the median line. The patient was supplied with an upper denture and evacuated to England on March 15, 1917 (Figs. 24 and 25).

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

Under the Editorial Supervision of

**JAMES DAVID MCCOY, D.D.S., Los Angeles—ROBERT H. IVY, M.D., D.D.S., Washington
B. FRANK GRAY, D.D.S., San Francisco—C. O. SIMPSON, M.D., D.D.S., St. Louis.**

It is the object of this department to publish each month original articles on dental and oral radiography. The editors earnestly request the cooperation of the profession and will gladly consider for publication papers on this subject of interest to the dental profession. Articles with illustrations especially solicited.

NOTES ON INTERPRETATION OF RADIOGRAMS*

BY B. FRANK GRAY, D.D.S., SAN FRANCISCO, CAL.

RAADIOGRAMS are quite commonly regarded as a record of shadows on the photographic film or plate. It is just as well, however, to analyze this conception just a little bit. An ordinary shadow is cast when an object is interposed between the source of light and the screen or field beyond the object. Usually the light does not pass through the object at all. However, in the case of the shadow of a cloud on the hillside, the sunlight, of course, does penetrate the cloud to a greater or lesser degree, and it may be noted particularly that the greater the light penetration in this instance the weaker the shadow.

In the radiogram we are much interested in light penetration. Indeed the picture is wholly dependent on the degree to which the x-rays penetrate the object interposed between the tube and the sensitive film. In the illustration of the shadow of the cloud, the greater the light penetration the weaker the shadow: in the radiogram the greater the penetration of the x-ray, the deeper the shadow. So I may leave it to you as to how analogous is the shadow in the one instance to that in the other.

Therefore the tone of a radiogram, whether dark or light, black or white, depends upon the resistance of the tissues through which the x-rays pass. Of course we assume a proper technic is observed, since a faulty method might result in having all tissues appear dark—or as deep shadows. On the other hand, an improper technic may make all tissues appear light in the radiogram. Thus, there would be no proper differentiation.

Let us assume a normal maxillary bone. We may lay back the soft tissues over the apex of a cuspid tooth. Then we shall remove the bony tissue at the immediate apex of the tooth to the extent of the size of an ordinary rifle bullet. We again put in place the thin outer layer of bone, and stitch the soft tissues

*Dr. Gray and Dr. Carter were invited to give instruction in Dental Radiography to a number of the members of the California State Dental Association last June. The "Notes on Interpretation" are here presented in the belief they may be of interest to some of our readers.—Editor.

up. A carefully made radiogram may reveal an area at the apex of this tooth very dark indeed. This so-called area is not due to any pathologic process at all. It is merely due to the mechanical or surgical removal of a certain portion of bone, and thus the resistance to the penetration of the x-rays is lessened. The worst sort of streptococcic infection—the most clearly defined "granuloma" might look no more dangerous than the radiogram we secure from such an experiment.

Unless we keep the rationale, i. e., the photography, the physics and the technic of the work in mind, we have no proper basis of interpretation. We may find ourselves reading disease—pathology—into practically every radiogram that we observe.

Have you seen in certain radiograms of teeth very decidedly dark lines following the outline of the tooth in its socket? Did it ever occur to you these dark lines represented pathologic conditions? They might—but the chances are they do not. But I know a prominent surgeon who insisted this was the case and this gentleman was one of the first in his community to make radiograms of teeth. He did not seem to appreciate that the investing membrane of the tooth and alveolus might permit of a relatively more rapid passage of the x-rays at that immediate point than elsewhere, and still the resultant picture would have no pathologic significance.

In the mouth where a tooth has been a long time missing, a radiogram of that immediate portion of the jaw may record a very dark area. It does not necessarily mean pathology at all, but only denotes the alveolar process or the true bone is either thin or osteoporous, permitting of the rapid passage of the rays at that point.

Beyond doubt the most difficult teeth to picture radiographically are the maxillary molars and premolars. This is due to the misleading and trouble-making maxillary sinus—also to the malar process, and further to the difficulty with which a film may be properly placed and held at this location. Because of the angle at which the rays must be directed for radiograms of the upper molars, the maxillary sinus is interposed between the tube and the film. The result is large enclosed dark areas about the roots of the molars and bicuspids. Some very intelligent dentists, even having had a year or two of experience in observing radiograms, have said "It looks like that tooth goes into the antrum." Well, I do not know that I ever saw a radiogram that showed conclusively that any tooth root penetrated the antrum, and I should like to see some of them. Doubtless some teeth do penetrate the antrum, but the difficulty is to tell from a radiogram whether they do or do not. There are doubtless more than 99 chances out of a hundred they do not. From necessity one must place the tube so high that the rays pass through the antrum before they reach the roots of the molars—with a resultant picture of these roots in such relation to the antral shadows that a novice may suspect they actually penetrate the antrum. Maybe stereoscopic radiography may assist the profession in this immediate problem, as by that method it is aimed to establish a real perspective in the radiogram, such as is not contemplated at all in the ordinary flat picture with which we are all more or less familiar.

We must learn to know what these antral shadows look like, and we must learn to make exposures at different angles, so as to eliminate these shadows as much as possible from the field we wish to critically observe—for instance about the apices of the roots of molars and bicuspids. Naturally enough the great variation in size and location of the maxillary sinuses has much to do with our problems. And again, we need to differentiate *between* shadows or so-called "areas." Thus we may detect significant records or shadows *within* these antral shadows.

Speaking of "areas" I believe the thought is quite general that a small "area" at the apex of a root signifies a relatively harmless condition, while a large "area"—as black as your hat—is sufficient cause for a major surgical operation within twenty-four hours. Now if we forget our bacteriologic studies, that way of thinking may do very well, but once we recall that a family of several million members can get on comfortably in quarters possibly no larger than half a pinhead in extent, then I think we shall have little ground for feeling so sure as to the small "areas."

And what about those so-called "dead teeth" that show no areas at all? Well, they may be just as bad as any of the others. In fact they may be far more insidious—as they do not invite very much suspicion. There is no guarantee whatever that such a tooth has no pathologic significance. I recall a case in point. A prominent oculist wished radiograms of the teeth of a patient suffering from a severe form of iritis. The maxillary lateral incisors, while nonvital, were fairly well filled, and showed no rarefied areas at apices. However, because of the urgency of the case, the family dentist opened up one of the teeth in question, and to the surprise of everybody a very considerable flow of pus was noted. Shortly afterward I received word the eye trouble was rapidly lessening.

Now there is another consideration I want you to get clearly in mind. Recall, please, the worst appearing "area" at the apex of a tooth that you can. Let us assume the tooth lost its pulp January 1 in the year 1900. A certain infective process started at once, although the pulp canal was pretty well filled, etc. Do you think a radiogram made March 1, 1900, would have revealed an "area"? Not necessarily. Would it have done so on July 1? Not necessarily. Certainly until *degeneration* of those tissues occurred, allowing of a lessened degree of penetration to the x-rays, you would have obtained no significant showing. I do not know just how long it takes to break down the tissues through these infective processes. I am an orthodontist and that takes up my time. If you can get clear-cut information on this subject it will be helpful. But the point is, how many radiograms do we make of nonvital teeth—well-filled canals—get a negative showing, and conclude all is well? And all the while there may be the most serious kind of an infection under way.

I take it many of you are going to maintain a conservative attitude relative to so-called dead teeth. Some of you are already convinced—or will be convinced—there is no half-way ground: and you are like the prominent physician in Colorado who says "There is no such thing as a good dead tooth." But while you are still maintaining your conservative attitude I feel the best possible advice I could give would be that you at least familiarize yourself with the con-

siderations I have just mentioned, and that you consider well the health and resistance of your patient. It would seem to me in the case of two patients, the first infirm and sickly, the other in robust health, that nonvital teeth (negative radiographic showing) in the first instance might be regarded as a possible serious menace, while in the latter instance similar teeth might not cause you to go to the same length of operative procedure.

If you will interest yourself enough in radiography to learn its technic—to learn somewhat of its photographic processes—you will presently find as much fascination in it as you might in any other hobby, and I assure you it may prove to be a very useful one. Do not delegate this work to your assistant. At least not until you have mastered it yourself.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

A Case of Isolated Division of the Great Hypoglossal Nerve. A. Barbe.
Le Progrès Médical, 1919, No. 38, p. 377.

In the case of a soldier who was wounded by a bullet in July of 1917, the course of the projectile could be reconstructed as follows: It entered the mouth, on the left side, at a moment when the mouth was open, passed through the buccal floor, causing a fracture of the angle and ascending maxillary ramus, inflicted a wound of the neck, exposing the carotid vessels, and passed then through the upper portion of the shoulder, fracturing the acromion. When the patient was examined thirteen months later, he presented no deviation of the mouth when this was at rest, but when he opened the mouth, it became slightly deviated downwards and to the right, assuming an oblique oral shape. The tongue was affected by a complete left-sided hemiatrophy, resulting in disturbances of speech with stammering; the patient was unable to protrude the tongue forwards, to draw it backwards, to draw it to the left side, to contract it towards the middle line, to raise it towards the velum of the palate, to roll it up, or to spread it out. The site of the wound and the existing motor disturbances justified the conclusion that the nerve had been divided at the point where after descending it becomes horizontal, so that its descending branch was not involved; on the other hand, the branches of the hyoglossus, styloglossus and geniohyoid muscles were apparently affected, and this opinion was confirmed by the electro-diagnostic findings. Sensation was normal in all its forms over the lingual mucosa. The tongue presented a wrinkled and puckered appearance, due to the underlying muscular atrophy; the masseter reflex was strong and lively. Electrical tests showed a very evident reaction of degeneration of the muscles innervated by the terminal branches of the nerve; the contraction of the geniohyoid was somewhat weakened. This case is noteworthy, for it constitutes a valuable laboratory experiment, plainly demonstrating that the great hypoglossal is an exclusively motor nerve. Isolated divisions of the twelfth pair are moreover extremely rare. According to Piersol, the motor fibers of the tongue are supplied by the hypoglossal, aided probably by the facial through the chorda tympani. Those of common sensation are from the lingual branch of the fifth for the anterior two-thirds and from the glossopharyngeal for the remainder, except the region just in front of the epiglottis, which is supplied by the

superior laryngeal from the vagus. The glossopharyngeal area somewhat overlaps the posterior third, as it supplies the circumvallate and foliate papillæ. The chief fibers of special sense are derived from the glossopharyngeal, their principal distribution being to the taste buds on the circumvallate papillæ.

Surgical Treatment of Gunshot Injuries of the Mandible and Its Surroundings. H. Joseph. *Archiv für klinische Chirurgie*, 1919, iii, No. 4, p. 995.

Gunshot injuries of the face, the neck, and the bony framework of the face, including simple perforations through infantry projectiles as well as extensive destruction of soft parts and bones through fragments of explosives, require for their proper treatment the cooperation of surgeons and dentists. The treatment of these lesions must aim at a twofold object, first, the repair of damaged soft parts; second, the fixation of bones the continuity of which has been destroyed. Upon the basis of personal experience in war hospitals devoted to this class of injuries, the author recommends autoplastic procedures in defects of the lower jaw and in pseudarthroses, as a reliable method without technical difficulties. The results, under aseptic conditions, are very favorable, as illustrated by the following figures: Of 52 cases of bone transplantation on the lower jaw, 34 healed with complete bony union, meaning that the site of implantation is absolutely solid, after several months' observation, following the definite removal of all dental dressings. Five cases proved unsuccessful, the graft being expelled under suppuration, or requiring removal. In four cases, one end of the graft became firmly united to the corresponding fracture end, while a pseudarthrosis originated secondarily at the other end; in such cases, an attempt is in order to remove the secondary pseudarthrosis by means of a repeated transplantation. Complete solidification may be anticipated in a reasonable period of time, in a number of other cases, so that the number of cures may be stated as 41 to 52, namely, almost 79 per cent.

The time required for healing after transplantations of bone varies greatly, irrespective of the size of the bridged bony defect. As shown by an investigation of the 34 completely healed cases, the shortest periods required for solidification were twelve to eighteen months in defects from 1 to 6 cm. in length. Two cases of pseudarthrosis, between which bone grafts of one and two cm. in length, respectively, were inserted, required the longest time for solidification, namely, fourteen and eighteen months. Individual differences of ossification and general nutrition are presumably of decisive importance in this respect, aside from the operative technic. The clinical material did not permit the demonstration of the length of healing being dependent upon the location of the fracture in the body or the ramus of the maxilla, or its position within or outside of the tier of teeth. The latest perfectly consolidated transplantations from the pelvis showed a certain regularity in the time required for healing, of about three to four months.

The complete solidification and clinical healing of the site of transplantation is by no means combined with an anatomically unobjectionable re-establishment in continuity of the bone. Absorptive and reconstructive processes are continued for a long time after the graft is healed in and solidified, so that the x-ray picture

after clinical consolidation usually still presents essential structural discrepancies between the graft and the fracture ends. It is not until all differences between the damaged maxillary region and the fragments have become anatomically compensated, as shown by the radiogram, that we are justified in assuming the complete regeneration of the destroyed portions of the bone, constituting a cure in the true sense of the term.

The material serving for the grafts, in the first 23 cases, was a periosteum and bone segment from the anterior edge of the patient's tibia; but as it appeared more advisable, in the interest of more rapid healing, to utilize a graft from a bone rich in bone marrow, the piece destined for implantation was taken from the iliac crest, in the second series of 32 cases. All the operations on the jaw, as well as for the removal of the bone segment, were performed under local anesthesia, like the plastic work on the soft parts; usually combined with interruption of nervous continuity in the mandibular nerve at the foramen ovale.

On Cancer of the Tongue. D. A. Power. *Medical Press*, 1919, cvii, p. 23.

In his report on cancer of the tongue, Power calls attention to the fact that it is almost entirely a human disease, unknown in children, common in men, and rare in women. Some of the factors which enter into the cause of this disease are irritations from various teeth.

He reports that an examination of the records at St. Bartholomew's Hospital showed that 169 persons were admitted with cancer of the tongue during 1909-1916. Nine of the patients were women and 160 were men. The proportion of men to women being 18 to one—the true proportion as shown by the Registrar-General's returns being one woman to eight men. Seven of the women were married, one was unmarried, and the social state of the other is not mentioned. Of the 7 married, one gave a history of syphilis, 2 showed evidence of syphilis, and one was a widow who had only one child alive out of five, the note adding "she looked as though she drank." None of the women smoked but all had bad teeth.

In the case of the men, 93 out of the 160 were syphilitic; 62 gave a history of syphilis. Many of the patients had drunk beer to excess, but did not as a rule acknowledge readily that they had taken spirits freely.

As cancer occurs sometimes in the domesticated animals, syphilis can not be considered as more than a disposing cause, and some exciting cause must be looked for which has become prevalent recently. The increased consumption of tobacco seems to be such a cause. Smoking in public has increased steadily from 1877, until it is now well-nigh universal among men, women, and boys. It is possible, therefore, that smoking is important in the increasing mortality from cancer of the tongue. The irritant acts in two ways locally, for it is partly due to the nicotine and partly to the heat, and it is well known from kangri cancer that thermal irritation is a factor in the production of epithelioma. The actual cause of cancer is still undiscovered, but if the main factors are known it should not be impossible to discover its nature.

Fistula of the Parotid in War Wounds of the Face and Jaw. P. P. Cole, *Lancet*, London, 1919, i, p. 971.

The rarity of this complication of facial wounds is illustrated by the small number of cases (16) which came under the author's care during a period of nearly four years. These fistulæ may affect the parotid gland on its duct, the former being incomplete or complete. The differentiation of incomplete fistula of the duct from fistula of the gland is difficult, and the diagnosis is sometimes a mere probability based on the position of the fistula. In the rare cases where healing is delayed, the application of radium or x-rays is indicated, to which gland fistulæ and incomplete fistulæ of the duct always reacted favorably in the author's experience. Complete fistula of the duct is incurable except by operative methods, preferably in the form of reparative procedures in which the mouth cavity is made to reach the duct. In two cases operated upon by the author with highly satisfactory results, a curved incision was made with convexity down and a small flap reflected upwards. This displayed the duct, the distal end of which was ill defined and buried in scar tissue. A small lateral hole in the duct marked the limit of potency. The duct was then freed, its terminal portion resected, and two very fine catgut traction sutures were passed through its walls. The mucous membrane covered by buccinator was then made prominent immediately in front of the masseter by means of a small swab pressed against it from inside the mouth, and a small longitudinal incision was made through it into the mouth. The masseter was nicked at its anterior border and the margins of mucous membrane stitched to the deeper margins of the wound. Through the aperture thus created, the stay sutures were passed and the duct was gently pulled into the funnel-shaped extension of the oral cavity. The duct was buried in the extension and the extension cut off from communication with the exterior by catgut sutures. The skin wound was then sewed up, drainage being established through a small stab incision. Each stay suture through the duct was then made to take a good hold of mucous membrane inside the mouth, so that when tied the duct was secured in place. In both cases slight suppuration with a discharge of saliva occurred about the tenth day. Communication with the mouth had, however, been well and visibly established and firm healing occurred in a few days. Both cases were kept under observation for three weeks and were then discharged as cured.

Displacement of the Mandibular Meniscus and Its Treatment. J. H. Pringle, *British Journal of Surgery*, 1919, vi, p. 385.

As in the knee-joint, so in the mandibular articulation, displacement of the meniscus is the result of some sudden movement.

Contrary to the usual description of the mandibular meniscus, the author has invariably found that there is a very decided central thickening of the disc in its coronal plane over the summit of the condyle. In front of this ridge there is a distinct depression in the disc which fits the tuberculum articulare of the temporal bone, while below and anterior to it there is a second thickening which forms the anterior border of the disc and in its lower part the insertion of the external pterygoid muscle. The author believes it is due to overaction or irregular action on the part of the external pterygoid muscle that the disc gets dragged out of its normal position.

After displacement the disc acts as a foreign body in the joint; either it gets caught between the rolling condyle and the tuberculum articulare or continues to move with the condyle but in flexion can not clear the articular eminence.

Pain, difficult mastication, and a definite feeling of obstruction in the joint preventing complete flexion are the main symptoms.

Reduction may be accomplished by keeping up hard pressure at the back of the condyle with the mouth open and slowly closing the jaw. In some cases this process must be repeated several times. The moment it succeeds, the sensation of the presence of a foreign body in the point disappears at once. In recurring cases the only method of treatment is operation.

In 1887 Annandale recorded two operative cases in which he sutured the loose disc to the periosteum. In 1911, the author removed the left disc in a young woman suffering from frequent recurrence and obtained a very good result.

Toxic Necrosis of the Maxilla Following Antiluetic Treatment. W. Schulze.
Mitteilungen aus den Grenzgebieten den Medizin und Chirurgie, Jena,
1918-19, xxx, p. 366.

The author arrives at the conclusion, on the basis of personal experience with five cases of toxic necrosis of the jaws recently treated in the Halle University Clinics, that these complications do not occur as a result of salvarsan treatment, which, on the contrary, will actually cure cases of ulcerative stomatitis (Plaut-Vincent) of the mucosa of the cheeks. In the presence of mercurial stomatitis, no further damage is done by simultaneous salvarsan treatment, but salvarsan is actually of great therapeutic value in certain cases of mercurial stomatitis. Gray oil, and mercinol, are dangerous preparations, which can not be sufficiently warned against. The prognosis as to life is not always favorable, as in the cases under the author's observation. In some patients who were admitted to Lesser's polyclinic, suffering from intoxication due to mercinol treatment, the stomatitis became rapidly associated with severe disturbances on the part of the digestive, uropoietic, and nervous systems, which in a short time led to death. Mercinol is a very dangerous remedy in the hands of others than experienced specialists. The proportion of the curative dose as compared to the fatal dose is 1:30. Accordingly, extreme caution is indicated in the employment of this remedy, taking into consideration all factors contraindicating its use in a given case.

The first of the author's five observations concerned an artificial necrosis of the jaw in a girl of twelve years, as a result of faulty treatment of a tooth on the part of a dentist with acidum arsenicosum, the employment of which in dentistry can not be sufficiently cautioned against. Cases of maxillary necrosis due to the local action of arsenic are not of frequent occurrence, aside from dental practice. In the second patient, a young man with sequestration of two alveoli in the left upper jaw, a mercurial necrosis developed as a result of combined iodide and mercury treatment. The third patient, a man of 27 years, had purulent stomatitis, followed by necrosis of the jaw, towards the end of anti-syphilitic after-treatment, during which he received besides salvarsan, four injections of mercinol in the course of four weeks, the maximum dose of the

remedy being administered each time. Salvarsan had been readily tolerated during a combined mercury and salvarsan cure, half a year previously, and is therefore not to be held responsible for this maxillary necrosis. The fourth patient, a woman 25 years of age, was attacked at the end of a six weeks' course of neosalvarsan and mercury treatment by stomatitis which finally led to necrosis of the entire alveolar process of the lower jaw. The condition in this case presented a remarkable resemblance to phosphorus necrosis. In the last patient, a woman 27 years of age, the course of the disease and the shape of the sequestrum indicated a tertiary luetic gummatous necrosis of the alveolar process. The gingivitis and sequestration appeared in a circumscribed locality, not diffusely, as in the four other cases; the disease began about three years after the luetic infection.

It has recently been shown that a form of mercurial stomatitis, which occurs in syphilitic patients, is caused by spirochetes in the buccal mucosa. Such cases are amenable to salvarsan medication, this form of mercurial stomatitis being entirely curable by salvarsan. If salvarsan possessed any cumulative action in the presence of an existing mercurial stomatitis, it would have to manifest itself under these conditions where the buccal mucosa itself is so severely damaged as to be open to attack and increased inflammation through the superadded salvarsan treatment. Maxillary necrosis does not occur after salvarsan treatment, and no such cases have been recorded in the extensive salvarsan literature.

Root Amputations. J. Levy. Dental Cosmos, 1919, lxi, p. 649.

The majority of dentists consider apicoectomy advisable in cases of chronic apical infections in which the bone peridental membranes, and not more than the apical third of the root are involved.

The roots of the 6 upper front teeth are amputated most easily, while in the case of the 10 lower front teeth, the upper bicuspids, and the molars, this operation is difficult.

Gutta-percha is regarded as the best material for filling the root canals. The use of chloroform and resin, chlorapercha, or sucapercha with the gutta-percha seems to be a matter of choice.

When the operation is followed by check radiograms the percentage of successes is moderately high.

Failures are reported as due to faulty technic, low vitality of the surrounding tissue, and re-infection.

For removing the apex of the tooth, the burr is given the preference over the chisel.

Six months is the average time required for complete regeneration of the bone in successful cases but varies with the patient's age and vitality.

Suturing the incision is recognized as being the preferable method of closing the wound as it tends to hasten the healing, prevent re-infection, and lessen the after-pain. In cases of extensive involvement, packing is advocated.

Opinion is divided as to whether apicoectomy should be performed by the specialist or the general practitioner. It is generally conceded, however, that

unless the general practitioner is well equipped, has a thorough knowledge of asepsis, and has developed a skillful technic, the operation should be performed only by the specialist.

Experiences with Transplant Grafts in Ununited Fractures of the Mandible. C. E. West. Proceedings of the Royal Society of Medicine. Section of Odontology, 1919, xii, No. 9, p. 221.

In the eighteen cases under consideration, the graft was taken from the rib in two cases, from the iliac crest in eight cases, and from the tibia in nine cases. From whatever source derived, the essentials of a good transplant graft appear to be: (1) Sufficient substance to allow of satisfactory fixation. (2) Sufficient rigidity to give real immobilization. (3) A fair amount of cancellous bone which can be got into contact with the rawed surface of the fracture ends. The essentials for satisfactory results may be stated as operative asepsis, use of extreme caution in avoiding too close an approach to the buccal cavity, actual contact of cancellous surfaces, and good fixation. At the end of the operation, the jaw should give the feeling of absolute rigidity. Because union implies vascularization, it is important that cancellous surface should be exposed on the areas with which the graft is to be in contact.

The results obtained in the Special Jaw Injuries Department, at the First London General Hospital, are fairly summarized in the following table:

Total transplant graft operations	19
Graft survived, apparently alive	17
Graft absorbed in presence of suppuration	1
Graft partially sequestered, union already secured....	1

Good union, 13 grafts; union satisfactory but with slight weakness at one end, 3 grafts; nonunion at one end, 1 graft; failure (absorption of graft) 1 case. Function, according to Dental Surgeon's Reports: Fairly good and improving, to complete restoration, 12 cases; poor, at date last seen, 4 cases; function not improved, 1 case.

Sympathetic Iridocyclitis and Possibly Related Processes in Other Parts of the Body. D. F. Harbridge. American Journal of Ophthalmology, 1919, ii, No. 4, p. 269.

This argument supports the idea that the essential causative agent of sympathetic ophthalmia may exist in the body outside of an injured eye, and be transmitted through the blood currents. Microorganisms entering the exciting eye through injury might become established elsewhere in the body. Based upon personal observations, the author emphasizes the vital importance of the existing condition of the teeth, tonsils, sinuses, or other possible foci of infection, capable of giving rise to a so-called sympathetic iridocyclitis, a heart lesion, or a joint infection. In the case of a patient 29 years of age, with a severe plastic iridocyclitis and marked signs of involvement of the other eye, two suspicious teeth were discovered and radiograms showed apical abscesses. Removal of the teeth was followed within ten days by practically complete recovery. Several years ago, a man 56 years of age, suffering from a severe attack of plastic iridocyclitis, was

seen by the author, who in considering this case in connection with more recent experience recalls that this patient had many decayed teeth and at times suffered severely with toothache. The question of a radiogram was not considered at that time; doubtless certain infective foci would have been observed. In view of present knowledge, the author is inclined to interpret sympathetic iridocyclitis as a secondary disturbance due to a local changed metabolism, the source of the agent being in the uveal tract of the injured eye or perchance, in some other part of the body, a part of a symptom-complex. A small apical tooth abscess may be responsible, containing perhaps a strain of streptococci with a special affinity for uveal tissue. A fuller understanding of the nature of sympathetic iridocyclitis demands a more searching investigation for possible related processes in other parts of the body.

When Teeth Are a Source of Focal Infection. L. B. Schlund. *North-western Medicine*, 1919, xviii, No. 7, p. 134.

The author emphasizes the importance of instructing patients to the effect that at the apex of a perfectly comfortable and useful tooth there may be attached a more or less virulent abscess. Pockets formed by irritation due to ill-fitting crowns and overhanging and unpolished fillings, particularly between the teeth, must also be taken into consideration. These pockets are frequently overlooked by any examination other than the x-ray. The most insidious of all dental lesions is probably represented by pyorrhea. Devitalized teeth are in many cases a positive menace, and at best are limited in length of life and usefulness. With special reference to caries, it is often necessary to perform temporary operations in order that nature may have a chance to aid and thereby lay a wall of defence, a thin layer of secondary dentin, between the pulp and the point of irritation. Later on, these temporary operations can be followed by permanent ones which will prevent the recurrence of caries and not cause sufficient shock to produce devitalization of the teeth. It is along these lines that the medical profession and dental profession must cooperate. As regards the filling of root canals, the author among fifteen hundred to two thousand teeth found only forty with canals filled to the end and twelve of these showed an abscess. Presumably, very few root canals are filled to the end, and these are always of the single roots, as the author failed to find a molar tooth, either upper or lower, with all the canals filled. Such teeth may and often do become a source of focal infection.

Composite Odontoma. F. B. Moorehead and K. W. Dewey. *Surgical Clinics of Chicago*, June, 1919, iii, No. 3, p. 645.

The authors report a rare case of composite odontoma in a young man twenty-three years of age. Although the origin of these anomalies is evident, namely, some disturbance in the development of the tooth germ, nothing is known concerning the cause of such disturbances. Trauma does not seem to play a part; although there are a few doubtful cases with a history of some external violence. The predominating substance in composite odontomas is dentin. Enamel is not constantly present, and may be entirely lacking. The presence of cementum is also inconstant. Bony substances are sometimes found. In the

authors' case, the convex surface of the tumor (which measured 3.5x2x2 cm. and weighed 20.5 gm.) was for the larger part of a dull grayish-yellow color, which was dentin tissue; the other part, about one-third, was covered with a pearly white, scaly layer of enamel, which was continued over almost the entire concave surface, where it assumed the form of stalactitic excrescences. The whole layer of enamel formation had a depth of 2 or more mm. The tumor was surrounded by a thick fibrous capsule; the presence of a connective-tissue capsule is mentioned only in a very few reported cases. The crown of a typical second molar tooth was placed against the surface of the tumor at its lower extremity. The specimen showed two roots fused into one; the smaller one was crippled in all dimensions, but distinct in outline, and was lying flatly and squarely on the other. In dissecting out and removing the fibrous sac, the inferior dental nerve was divided, but this has since regenerated, restoring sensation to the lower lip.

The Lipoids in Tumors of the Dental Region. K. W. Dewey. *The Journal of Cancer Research*, 1919, iv, No. 3, p. 263.

The lipoids in pathologic dental tissue are chiefly cholesterol, occurring as the stable ester compound, but much more frequently in more or less loose combinations with fatty acids and other lipoids. The fatty acids and soaps which are found in certain tumors are located chiefly in the zone of squamous epithelial cells. Otherwise, they occur in the degenerated walls of blood vessels in tissue with a depleted blood supply. Fatty acids and soaps are found in areas where hyaline degeneration and calcification also are observed. The question of whether, or how, these substances may be involved in the process of calcium depositions, has not been approached in the practical part of this study. The specimens were obtained from Dr. Moorehead's clinic for oral surgery, of the University of Illinois, and included endotheliomas, fibromas, giant-cell sarcomas, cysts and ordinary hypertrophy of the gum tissue. On the basis of conclusions arrived at in studying tumors and cysts of the dental region, for their lipid content, the author claims that by employing modern staining methods and utilizing the polarizing microscope, the nature of the different lipoids in tissues can be established with a fair degree of accuracy and in a much larger measure than was hitherto possible. The presence of cholesterol denotes life and activity; cells very seriously injured, although still alive, seem to be unable to store lipoids.

Chronic Superficial Glossitis as a Reflex Necrosis. H. C. Greve. *Münchener Medicinische Wochenschrift*, 1919, No. 17.

The author reports an observation on a nervous woman, at the age of the menopause, who had been operated upon for gastric ulcer under the erroneous diagnosis of carcinoma. Small excoriations, associated with severe pain, made their appearance on the border of the tongue, and the patient feared the development of lingual cancer. She suffered from so-called hairy tongue and typical superficial glossitis, the severe disturbances being the sequel of reflex neuralgia originating in the splanchnic system. The chronic intestinal disturbances which affected the patient at the time of the climacteric, were responsible for this nerv-

ous irritation, through pathologic circulatory and nutritional processes. The observer points out that superficial glossitis and glossodynbia exfoliativa are two varieties of the same disease, the nervous etiology of which is indicated by the above case as well as a number of instances in the literature. The treatment must accordingly be directed especially towards existing general anomalies, in order to counteract the establishment of a reflex necrosis.

Diathermy for Epithelioma of Palate, Tonsils, Tongue, and Floor of Mouth. N. Patterson. *Proceedings of the Royal Society of Medicine. Section of Laryngology*, 1919, xii, No. 9, p. 182.

The author's patient was well nearly four years after the first appearance of the disease. He was a man 59 years of age, first seen in June, 1915, with epithelioma of the soft palate and right tonsil. Diathermy was applied twice within a short period. In April, 1917, the patient presented himself with an extensive growth involving the right side of the tongue and floor of the mouth. There was also a large swelling in the submaxillary region. The growth was treated with diathermy and the electrode was plunged deeply into the floor of the mouth in many directions. Shortly after this the mass in the neck was removed by dissection. At one time the case looked quite hopeless, but at the time of the present report the patient is well and able to work, and there is no sign of the original disease.

Survey Teeth. L. L. Zilva and E. M. Wells. *Proceedings of the Royal Society of Medicine*, 1919, B, xc.

The authors describe the changes observed in the structure of the teeth of scorbutic guinea pigs, on examination of a great number of teeth derived from animals in various stages of scurvy. It could be demonstrated that the mildest degree of scurvy, just discernible to the unaided eye at autopsy, led to the production of well-defined microscopic changes in the structure of the teeth in all the examined cases without exception. In advanced scorbutic conditions the teeth were found to be apparently sound but useless through having become loosened by the gradual absorption of the cement membrane of the alveolar pockets, leaving exposed the portion below the neck. This condition was presumably associated with periostitic pain. The teeth moreover presented all the appearance of senile change. In young guinea pigs, precisely the same condition was found as in the older animals. With monkeys as subjects, the production of radical changes in the teeth through a deficiency of the diet in antiscorbutics was likewise definitely established. Without drawing definite conclusions from their work at this stage, the authors suggest on the basis of their findings in animals, that deficiency in diet may be shown by future research to be responsible for the great prevalence of dental decay among civilized communities.

Dental Infections in Children. A. L. Smith. *Archives of Pediatrics*, 1919, xxxvi, No. 3, p. 148.

The author's report covers 109 cases of peridental infections in children, collected from the available medical literature. The children's ages ranged from

two and a half to eleven years. Four secondary fistulæ, eight gingival abscesses, one abscess in the roof of the mouth and one infected submaxillary gland are also included. The relationship existing between peridental infections and systemic diseases is not considered in the present contribution, which deals essentially with causative factors. The following is a table of the microorganisms and their number, found in the 109 cases of peridental infections:

1. Streptococcus hemolyticus	27
2. Streptococcus pyogenes	19
3. Streptococcus viridans	2
4. Staphylococcus pyogenes citreus	9
5. Staphylococcus pyogenes aureus	37
6. Staphylococcus pyogenes albus	7
7. Bacillus pyocyaneus	1
8. Diplococcus pneumoniae	18
9. Micrococcus catarrhalis	4
10. Bacillus fusiformis (Vincent's angina) Spirochete Vincenti....	1
11. Diphtheroid bacillus	3
12. Sterile	8

Children's teeth, infected as they are, must be extracted, if the focus can not otherwise be sterilized, and this rarely can be accomplished. Malocclusion as an indirect result of premature extraction of deciduous teeth is a lesser evil than the constant absorption of infected material from the peridental area.

The Toothless Mother. Note in Lancet, London, 1919, i, p. 922.

The National League for Health, Maternity, and Child Welfare, in London, England, is about to try an interesting experiment, made possible by the generosity of Miss Gibson, who out of a donation of two thousand pounds to the League, has asked that five hundred pounds be spent on facilitating the provision of dentures for mothers attending welfare centers in London and Greater London. A whole-time dental mechanic is therefore to be engaged and a work-shop fitted up for him, where dentures ordered by the dentists engaged at dental clinics attached to mothers' centers will be made, only the cost of the materials being charged. Since the charge for labor is the most expensive part of dentures, it is hoped in this way to reduce the present high cost of teeth for necessitous mothers, thousands of whom are perhaps injuring their babies through their mouths being septic. The Children's Jewel Fund is contributing two hundred and fifty pounds towards the scheme, which should also encourage the establishment of more dental clinics for mothers, now greatly needed.

The International Journal of Orthodontia and Oral Surgery

PUBLISHED THE FIFTEENTH OF EVERY MONTH BY

THE C. V. MOSBY Co., 801-809 Metropolitan Bldg., St. Louis, Mo.

Foreign Depots—*Great Britain*—Henry Kimperton, 263 High Holborn, London, W. C.; *Australasia*—Stirling & Co., 317 Collins Street, Modern Chambers, Melbourne; *India*—“Practical Medicine,” Egerton Street, Delhi; *Porto Rico*—Pedro C. Timothee, Rafael Cordero 68, San Juan, P. R.

Subscription Rates—Single copies, 50 cents. To anywhere in United States, Cuba, Porto Rico, Canal Zone, Mexico, Hawaii and Philippine Islands, \$5.00 per year in advance. Under foreign postage, \$5.40. Volume begins with January and ends with December of each year.

Remittances—Remittances for subscriptions should be made by check, draft, postoffice or express money order, or registered letter payable to the publishers, The C. V. Mosby Company.

Contributions—The editor will be pleased to consider the publication of original communications of merit on orthodontic and allied subjects, which must be contributed solely to this journal.

Opinions—Neither the editor nor the publisher hold themselves responsible for the opinions of contributors, nor are they responsible for other than editorial statements.

Reprints—Since it is not desirable to hold type standing longer than absolutely necessary, all requests for reprints should be made at time of submitting manuscript for publication. Rate card will be sent with galley proof.

Communications—Contributed articles, illustrations, letters, books for review, and all other matter pertaining to the editorial department should be addressed to the Editor, Doctor Martin Dewey, 25 East Washington Street, Chicago, Ill. All communications in regard to advertising, subscriptions, change of address, etc., should be addressed to the publishers, The C. V. Mosby Company, 801-809 Metropolitan Building, St. Louis, Mo.

Illustrations—Such halftones and zinc etchings as in the judgment of the editor are necessary to illustrate articles will be furnished when photographs or drawings are supplied by the authors of said articles.

Advertisements—Objectionable advertisements will not be accepted for publication in this journal. Forms close first of month preceding date of issue. Advertising rates and sizes on application.

Change of Address—The publishers should be advised of change of subscriber's address about fifteen days before date of issue with both new and old addresses given.

Nonreceipt of Copies—Complaints for nonreceipt of copies or requests for extra numbers must be received on or before the fifteenth of the month of publication; otherwise the supply is apt to be exhausted.

Entered at the Post Office at St. Louis, Mo., as Second-Class Matter.

EDITORIALS

The Possibilities of the American Society of Orthodontists

IN this issue of the JOURNAL will be found an advance copy of the program of the next meeting of the American Society of Orthodontists. In looking over this program one can not help but be impressed with the possibility of good that can be derived from such papers, provided the members enter into the spirit of the meeting as the officers of the society have intended they should. From the standpoint of one who is more or less familiar with the American Society of Orthodontists since its organization, we can say that we know of no program that covers the field of orthodontics more completely than the program which has been arranged for the coming meeting. The Board of Censors have secured eight excellent papers and one more. If any criticism were to be made regarding the number of papers, so far as producing a good meeting for the entire membership, we would say that the Board of Censors has probably secured more papers than can be satisfactorily discussed in a three-day meeting.

There was a time when the society was composed of a smaller number of members than it is now, and the tendency of the Board of Censors was to collect a great number of papers, because the discussion would probably be limited. However, as the membership has increased, and the society is now made up of men who have spent a number of years in practice, and also of newer men whose practical experience is more limited, it seems to us that one of the greatest advantages of the Society from the standpoint of all the membership, would be to have free and unlimited discussions of the papers. We remember at the last meeting in St. Louis at least two very excellent papers were read that received no discussion. In fact, one of the essayists was so crowded for time that he gave his paper in a very hurried manner in order to catch the train for the East. As the result of this haste, a great amount of good which could have been produced by a free discussion of those two papers remained dormant, because every one in the society felt time was limited, so consequently did not enter into the discussion. There are, on the other hand, a number of men who object to the discussion of the papers, and are of the opinion that it should be limited in the meeting, and that it should also be limited in the publication of the proceedings. We realize that very often in the discussion of a paper the man who has the floor may not be telling anything new or interesting to a half dozen of the members present, but there may be others in the society who are benefiting by the discussion. It therefore follows that members of such societies as the American Society of Orthodontists should be at least courteous enough to listen to the discusser, even though they may not agree with him or be particularly interested in what he is saying on the subject. A society as large as the American Society of Orthodontists should be conducted for the good of the greatest number, and not for the advancement of the pet ideas of a selected few.

In selecting papers for the 1920 meeting the Board of Censors have tried to cover the orthodontic field in a satisfactory manner and secure papers some of which dealt with the practical side of orthodontia and problems which are prominent in practice today, as well as a number of papers which may be termed "scientific" that have a bearing on orthodontic facts. In doing this they have also attempted to arrange the papers in logical order, and consequently have placed the paper by Dr. W. K. Gregory on "The Evolution of the Human Dentition," first. To those who have been so mechanically inclined as to avoid the study of the development of the teeth and the supporting structures from a histologic or evolutionary standpoint, this paper at first sight probably seems to have very little practical bearing. However, we are convinced that a large number of etiologic factors in malocclusions, conditions of underdevelopment and overdevelopment, as well as the shape and size of certain individual teeth, can be traced back to the evolutionary influences which have been operating upon the dental apparatus ever since animals first possessed teeth. From a personal acquaintance of Dr. Gregory, we know he is one of the few men who has devoted a great amount of time to the study of the human dentition from an evolutionary standpoint, and we are convinced that he will give many facts that are very interesting and instructive, provided his audience familiarize themselves enough with comparative and human dental anatomy, as well as the embryology of the parts, to be able to assimilate his paper. Following this is placed a paper

by Dr. Milo Hellman, on "The Etiology of Malocclusion." We are more or less familiar with the work which Dr. Hellman has been doing in the past years, and also since the last meeting of the society in St. Louis, and can, therefore, assure our readers that he will present a number of facts that have never been gathered together before. Following this on the afternoon of the first day Dr. Kemple will read his paper, "Our Limitations in Orthodontia." Dr. Kemple is one of the members of the society who has spent a number of years in the special practice of orthodontia and will probably rank among six men in the Society so far as years of practice are concerned. As a result of this, he is able to present a paper on a subject that at first glance may seem more or less revolutionary, but that is, nevertheless, extremely practical, because we must realize that there are certain limitations in orthodontia, which a few years ago were not considered as such. There was a time when a number of men believed that a normal occlusion, or, in reality, an ideal occlusion, could be obtained in every case; but that was before malocclusions were recognized as pathologic conditions influenced by a large number of systemic disturbances over which the practitioner had no more control than other specialists have over certain conditions they encounter in the human body. Briefly, we may say that our limitations in orthodontia are circumscribed by the condition of the material or tissue which we are compelled to work upon, and the sooner young men recognize that condition, the less likely will they be to promise their patients results which they can not accomplish. This paper should open up a large field of discussion, and if the various members will be frank enough to tell the truth about some of their cases, volumes of information will be available which probably has been kept in the dark for some time.

The Board of Censors, realizing that pathologic conditions have a close relation to the etiology of malocclusion and also a bearing upon the permanency of the results obtained, have been able to secure Prof. A. Hopewell Smith, who will give a paper on "Recent Advances in Oral Pathology." This paper will be followed by one on "The Pathology of Dento-Facial Deformities," by Dr. B. E. Lischer, of St. Louis, who for a number of years has made a special study along these lines and photographed a large number of cases and collected invaluable data dealing with the conditions. We believe it is not the intention of the board of censors that these two papers should be in any way related or be discussed together. We are convinced that when two papers are discussed together, even though they are more closely related than the papers by Prof. Smith and Dr. Lischer, one suffers from neglect. The members will obtain more good from these papers if they keep them separate, and be prepared to discuss them separately.

The next paper, is that on "Plastic Surgery" by Dr. J. C. Beck, of Chicago. While this subject is not strictly an orthodontic one, still it has a relation in regard to dentofacial deformities with which the orthodontists must be familiar. Before passing this paper, we feel that it would be unfair not to call attention to the men who have been placed on the program to discuss it. In the first place, the Society is to be congratulated on possessing two men of the types of Major Jos. D. Eby, and Lt.-Col. Guy Hume. Major Eby left the private practice of orthodontia when America entered the war, and was very soon given a position in the Dental Officers' Training School organized by Col. Logan. With

the signing of the Armistice and the discontinuation of the Dental Officers' Training School, Major Eby was transferred to the Walter Reed Hospital, where he is still stationed in the Maxillo-Facial Department and has done an enormous amount of work in maxillo-facial restoration. Lt.-Col. Guy Hume was a member of the Board of Censors of the American Society of Orthodontists. He went overseas with the first Canadian troops, and remained on the active front practically the entire duration of the war.

Following a number of papers covering various principles in orthodontics, the next two subjects deal with the practical side of the science, one in regard to regulating appliances, and the other in regard to the Principles in Retention. Dr. V. H. Jackson will give a paper on the "Principles of the Jackson Removable Appliance," which appliance possesses a great many valuable features that some men have failed to recognize even up to the present time. We hope that the members of the Society in discussing this paper will confine themselves to the subject: namely, the principles of removable appliances, and not try to bring in some pet hobby of their own to befog the issue. We remember in times past when papers on the principles of appliances have been read before the Society, there has been a tendency not to discuss the factors as indicated and outlined in the paper, but rather to enter upon some pet theory or device, such as the modification or an improvement of the appliance, which had absolutely nothing to do with the paper. We remember a paper was read at the American Society of Orthodontists at Excelsior Springs, dealing with certain forms of appliances: instead of those appliances being discussed, various members got off the issue and discussed "how to rotate a certain tooth." The next year a paper was read at the Chicago meeting with exactly the same results: the principles of appliances were not discussed at all, but the majority of time was taken up by the discussion of appliances that had not even been mentioned in the paper. There are certain basic features employed in the construction of regulating appliances that must be considered and followed out and that are much greater than any idea upon which some individual man may have obtained a patent.

The committee has been fortunate in obtaining Dr. Calvin S. Case to write a paper on "The Principles of Retention in Orthodontia," on which we can again say we hope the members of the Society will confine themselves to principles of retention. We are aware that retention is one of the biggest subjects in orthodontia today, and it would be possible for three or four papers to be presented dealing with that one subject alone. In fact, it would be possible to have several papers presented on the etiology of malocclusions and several more on retention, which two subjects would be sufficiently large for a three-day meeting. We fear that in the presentation of Dr. Case's paper on "The Principles of Retention" some of the members are again going to diverge from the subject and instead of confining themselves to the issues, will discuss a retaining appliance that they have employed in some particular case. Such a thing would be perfectly proper if one entire day were given to the discussion of principles of retention in addition to the retention employed in certain types of malocclusion and several different men were selected to write papers on this subject. In other words, if a symposium on retention was arranged by the Board of Cen-

sors giving an entire day to that subject, we feel that a great amount of good could be accomplished for the entire membership of the society.

We would also suggest that various members who are going to attend the meeting familiarize themselves with the topics as outlined in the program and be prepared to intelligently discuss or at least ask intelligent questions upon the subjects presented. We believe that the Board of Censors have done their duty, and they rendered the society an excellent service by securing these various papers, and it remains for the individual members to say how much they are going to get out of these papers or whether they are going to try to make this a "special affair." If the American Society of Orthodontists is to grow and develop into a scientific body, it will have to be through the united efforts of the members, because the various officers have done practically all they can when they have prepared the excellent program which is published in this issue.

For Wednesday a number of interesting clinics and case reports have been arranged. Under the heading of case reports it is the wish of the Board that members will show unusual cases which have presented interesting etiologic factors and which have shown certain problems in treatment that are out of the ordinary. The older men are also being appealed to for cases three years after retaining appliances have been removed, which is in keeping with Dr. Kemple's paper on "Our Limitations in Orthodontia." We are convinced that because of evolutionary factors, etiologic problems, and pathologic conditions, all of which will be dealt with in papers at this coming meeting, we find a certain number of malocclusions in which it is absolutely impossible to obtain an ideal result. We know that the oculist finds certain cases in which he can not correct the vision without the permanent use of glasses; we also find the rhinologist forced to perform various surgical operations in order to improve the breathing. Therefore, the orthodontist is rather foolish to believe that with all the various etiologic factors and conditions that may be encountered he alone of all the medical specialists is able to produce an ideal result under all circumstances. It is the tabulation of these various conditions that can be brought about by case reports that the board of censors are desirous of obtaining, and we are sure that anyone with such a case will receive a favorable consideration if they will kindly report it.

Raise In Subscription Price

WITH the February issue of the INTERNATIONAL JOURNAL OF ORTHODONTIA AND ORAL SURGERY, the subscription price will be raised to \$5.00. As a reason for this increase, we only need point to the fact that cost of printing and paper, and the making of illustrations, has increased from one hundred to three hundred per cent since the Journal was started five years ago.

The publishers feel that the readers of this Journal prefer to pay an additional cost of two dollars the year rather than have the quality of the Journal lowered in any particular.

Through the medium of this publication, orthodontia has assembled a literature during the past five years that rivals that assembled by any specialty in medicine. During this time nearly five thousand pages of text matter with between thirty-five hundred and four thousand illustrations pertaining to orthodontia and its allied specialties have been published in it.

Every nation on the globe where dentistry is practiced is represented among its subscribers. Orthodontia as a specialty has developed during the past five years far beyond the wildest dream of its founders, and this journal has played no inconspicuous part in its development.

The success attending this undertaking has convinced the friends of dentistry that an independent special journal can live, and that it is not necessary for a journal devoted to the upbuilding of dental science to be sponsored and maintained by dental manufacturing concerns.

ORTHODONTIC NEWS AND NOTES

The editors desire to make this department a permanent feature of the Journal, but in order to do so must have the full support of the orthodontic profession throughout the country. We would deem it a great favor if our subscribers and readers would send in such announcements as might be of interest to the profession.

Meeting of the American Society of Orthodontists

THE Twentieth Annual Meeting of the American Society of Orthodontists will be held at the Edgewater Beach Hotel, Chicago, Ill., Monday, Tuesday, and Wednesday, April 5, 6, and 7, 1920.

The Board of Censors have arranged the following program to which will be added a number of clinics and reports of cases. The list of clinics is not complete at this time.

Monday, April 5, 1920

President's Address.

John G. V. Mershon, Philadelphia, Pa.

Report of Board of Censors on new members and election of officers.

Report of committees, unfinished business, new business.

Monday, 2 p. m.

Evolution of the Human Dentition.

W. K. Gregory, New York City.

Discussion opened by:

A. LeRoy Johnson, Boston, Mass.

Martin Dewey, Chicago, Ill.

The Etiology of Malocclusion.

Milo Hellman, New York City.

Discussion opened by:

B. W. Weinberger, New York City.

O. A. Oliver, Nashville, Tenn.

Our Limitations in Orthodontia.

F. C. Kemple, New York City.

Discussion opened by:

J. Lowe Young, New York City.

Samuel P. Cameron, Philadelphia, Pa.

Tuesday, April 6, 9 a. m.

Recent Advances in Oral Pathology.

A. Hopewell Smith, Philadelphia, Pa.

Discussion opened by:

H. E. Kelsey, Baltimore, Md.

Ralph P. Waldron, Newark, N. J.

The Pathology of Dento-Facial Deformities.

B. L. Lischer, St. Louis, Mo.

Discussion opened by:

W. A. McCarter, Topeka, Kansas.

Walter Ellis, Buffalo, N. Y.

Tuesday, 2 p. m.

Plastic Surgery.

J. C. Beck, Chicago, Ill.

Discussion opened by:

Maj. Jos. D. Eby, Walter Reed Hospital.

Lt.-Col. Guy Hume, Toronto, Canada.

The Principles of the Jackson Removable Appliance.

V. H. Jackson, New York City.

Discussion opened by:

C. W. B. Wheeler, New York City.

Wm. H. Gilpatrick, Boston, Mass.

Principles of Retention in Orthodontia.

Calvin S. Case, Chicago, Ill.

Discussion opened by:

F. M. Casto, Cleveland, Ohio.

C. A. Hawley, Washington, D. C.

Tuesday, 6:30 p. m.

Banquet and Roll Call.

Wednesday, April 7, 9 a. m.

Clinics and Case Reports.

Wednesday, 2 p. m.

The Indication and Counterindication for the Extraction of Teeth for the Purpose of Correcting Malocclusions.

Martin Dewey, Chicago, Ill.

Discussion opened by:

J. A. Burrill, Chicago, Ill.

Herbert Pullen, Buffalo, N. Y.

Alumni Society of the Dewey School of Orthodontia

The next annual meeting of the Alumni Society of the Dewey School of Orthodontia will be held at the Edgewater Beach Hotel, Chicago, Ill., April 1, 2, and 3, 1920.

The following program has been arranged to date, which includes both papers and clinics:

President's Address.

E. G. Weeks, Saginaw, Mich.

Impactions of Temporary Teeth.

Frank M. Casto, Cleveland, Ohio.

Why We Insist on Early Orthodontic Treatment.

T. G. Duckworth, San Antonio, Texas.

Calcification of the Bones, and Its Bearing Upon Malocclusion of the Teeth.

Milo Hellman, New York City.

Getting on with Children in the Practice of Orthodontia.

Geo. F. Burke, Detroit, Mich.

A New Type Molar Band and Locking Device for Lingual Appliance.

Joseph E. Johnson, Louisville, Ky.

The Soldered Lingual Arch, and the Principle of Anchorage.

Martin Dewey, Chicago, Ill.

Treatment of Class One Cases.

Oscar Busby, Dallas, Texas.

Orthodontic Principles in Facial Injuries.

Maj. Joseph D. Eby, Walter Reed Hospital, Washington, D. C.

Failures or Unsatisfactory Cases in Orthodontic Treatment.

D. S. Sterrett, Erie, Pa.

Spring Attachments for Tooth Movement.

A. C. Gifford, Oshkosh, Wisc.

Modification of Roach Impression Trays for Making Metal Models of Teeth to be Banded, Facilitating the Accurate Fitting of Bands.

Landis H. Wirt, South Bend, Ind.

Hygienists for Orthodontists.

H. B. Hamilton, Ithaca, N. Y.

The Use of Pin and Tube Appliances, Using Half-round Pins.

Geo. W. Grieve, Toronto, Canada.

A Treatment of Open Bite Conditions.

Martin Dewey, Chicago, Ill.

The Use of Court Plaster as Used in Mouth Breathing.

Geo. Burke, Detroit, Mich.

The Multiple Loop Stationary Lingual Appliance.

C. E. Byington, Chattanooga, Tenn.

O. A. Oliver,

Chairman of Program Committee,
Nashville, Tenn.**Notes of Interest**

Dr. C. Verne Smith has opened his office in the Mason Building, Saginaw, Mich., for the practice of orthodontia.

Dr. Thad Morrison and Dr. Donald Morrison announce the opening of their new offices, 909-11 Candler Building, Atlanta, Ga.

Dr. James W. Ford, Jr., has opened his office in the Stevens Building, 17 N. State Street, Chicago, Ill., for the practice of orthodontia. Dr. Ford has also taken a position as Clinical Demonstrator of Orthodontia at the Chicago College of Dental Surgery.

Dr. Chilton E. Byington announces to his clientele and friends that his future practice will be limited to orthodontia, 1115 James Building, Chattanooga, Tenn.

Dr. Ed. J. Copping announces the opening of his office at 921 Fifteenth St., N. W., Washington, D. C., for the practice of orthodontia.

Dr. W. B. Childs announces the opening of his office at 706 Candler Building, Atlanta, Ga., for the exclusive practice of orthodontia.

Dr. E. B. Arnold announces the opening of his office at 915 Union National Bank Building, Houston, Texas, for the exclusive practice of orthodontia.

Dr. L. James Porter has accepted a position on the Orthodontia Clinical Staff of the College of Dental and Oral Surgery of New York.